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THE IRON AGE

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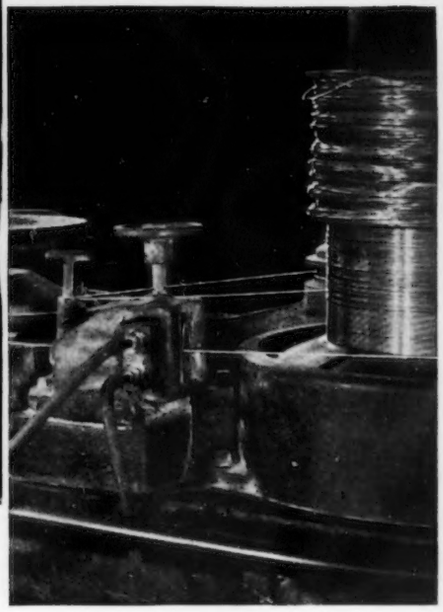

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NOVEMBER 3, 1938

ESTABLISHED 1855 Vol. 142, No. 18

Speaking of Monopoly Investigations - - -

AFTER the elections are out of the way, so there will be no political implications connected with it, we are going to have a monopoly investigation.

It will be conducted, so we are told, in a spirit of fair-minded economic research and study and not as a "devil baiting" campaign to make newspaper headlines or to arouse class antagonism.

That's fine. We will all welcome the opportunity to have the question settled as to whether bigness means badness. And to find out whether there are powerful organizations in our midst that are exploiting the American consuming public.

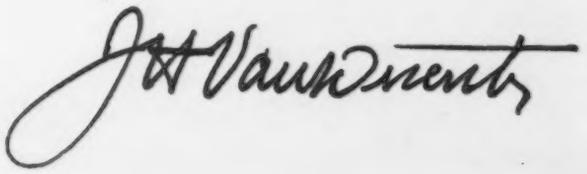
If this investigation is approached and conducted in a fair way, it will look at and record both sides of the question. It will not just try to show the bad things that some of the big fellows may have done; it will attempt also to reveal the benefits to the public that have come from bigness.

How big should a company or corporation be permitted to be? Big enough to best serve the public interest. The interests of the consuming public. When a corporation or any other organization gets beyond that point, it is getting too big.

Is the Ford Motor Co. too big, or the U. S. Steel Corp. or American Tel. & Tel., or General Motors? The customers who are served by such companies are the ones who could give the best evidence on this point. Does the chap who steps on the starter button of his car say to himself: "Perhaps I would get more for my money if the maker were limited to employing 30,000 workers instead of 100,000?" When you make a long distance call, does the thought occur to you that you would get much better service if it went through 10 or 12 independent systems instead of through one?

Of course, if we find that there is some huge monopoly in this country which has no competition and therefore can and does raise the price of its products to its consumers year after year, we should do something about it.

And approaching this monopoly investigation in a spirit of fairness, why not add government itself to the list of organizations under scrutiny? Government as it has now become is the biggest business that we have. It has no competition. And it is the one and only big business which has been continuously raising the price of its product to its consumers.



ELECTRIC-FURNACE BRAZING

APPLIED near the joints of an assembly to be furnace brazed, the brazing metal first melts, then wets the parent metal and, finally, creeps into the joints by capillary attraction. Both the wetting and the creeping are basic phenomena; an understanding of them will go far to eliminate unsatisfactory results due to improper surface preparation and improper fitting of parts to be brazed. The present article is the fourth in the series by Mr. Webber; the previous ones appeared in THE IRON AGE of Sept. 8, Sept. 15, and Sept. 22, respectively.

CAPILLARY attraction does some queer but interesting tricks. For instance, if two clean glass plates are immersed in water and held closely together, the water will wet the glass and rise in a column between the plates. However, if glass plates are immersed in mercury no wetting takes place, and the column of liquid is actually depressed below the surface of the mercury. This is illustrated in Fig. 45 at *A* and *B* respectively.

Water and mercury do not behave the same, however, with all materials. For example, if paraffin plates are immersed in water, no wetting results, and we get a depressed column at *B*, the same as with glass in mercury. Also, if amalgamated zinc plates are immersed in mercury, good wetting results and the column will rise. The smaller the gap between the plates the higher the column will rise. Obviously, then, if we wish to have a liquid drawn between two surfaces, the liquid must wet the surfaces and the surfaces should be very close to one another.

Capillary Attraction in Furnace-Brazing

Now what does all this have to do with electric-furnace brazing? Well, it has been found that if assemblies with clean surfaces are put together in such fashion that their joints are snug and tight, brazing metal such as copper applied near the joints will melt and wet the parent metal such as steel and creep into the joints by capillary attraction, providing a suitable controlled atmosphere is maintained within the furnace or other precautions are taken to assure that the surfaces will stay clean and free from oxides.

To further illustrate the principles of capillary attraction, and its relationship to furnace brazing, Figs. 46 and 47 have been prepared, using India ink and strips of glass spaced apart with different gaps, held in position with sealing wax.

Fig. 46 shows the relationship between the wetting action and capillary attraction, and illustrates the desirability of cleanliness of metal surfaces within joints to be furnace brazed. *A* and *B* were pieces of glass ½ in. wide by 4 in. long, fastened to pieces of glass 1¼ in. wide by 5 in. long. The strips of glass were held in intimate contact throughout their length and immersed in about ½ in. of India ink in a glass dish. The surfaces of glass in *A* were chemically cleaned to remove oil films and assure good wetting, by dipping the glass in hot sulphuric acid and potassium dichromate, and rinsing in distilled water. The surfaces of glass in *B* were fairly clean, but fingerprints were purposely impressed on both strips of glass to assure the presence of oil films. The result is obvious. In *A* the ink climbed as high as it could by capillary attraction, uniformly wetting the glass. In *B* the ink climbed until it reached the fingerprints, where wetting became difficult. However, passages around the fingerprints were soon established, and the ink continued to creep upward, going around small oil spots on its way. A pencil points to the unwetted fingerprints. If the ink were brazing metal instead, the bond would not be expected to have maximum strength or tightness where the surfaces were unclean.

Why Uniform Fits Are Desirable

In Fig. 47, all pieces of glass were chemically cleaned to assure good wetting, but various gaps were used between the strips, to show the effect of the width of the gap upon the height of the ink column, and to illustrate the desirability of having uniform fits in assemblies to be furnace brazed. The spacings of the glass strips were as follows:

A, uniform contact (no gap) throughout.

B, uniform gap of 0.001 in. throughout.

C, tapered gap from bottom to top: Intimate contact (no gap) at bottom, 0.020 in. gap at top.

D, tapered gap from left to right: Intimate contact (no gap) at left, 0.020 in. gap at right.

In *A*, the ink climbed in a very thin film to the top of the small glass strip.

In *B*, the ink climbed as high as its surface tension could draw it through the uniform gap of 0.001 in.

In *C*, the ink started to climb from the bottom where there was no gap, but it soon reached a level where the gap was so wide that the surface tension could pull it no higher. The width of the gap at this point was about 0.006 inch.

In *D*, the ink rose a short distance above its surface, between the glass strips which were touching at the left and were 0.020 in. open at the right, but soon stopped climbing along the right edge. It continued to climb along the left edge, however, until it reached the top, and the height of the column between the left and right edges adjusted itself to the varying width of the gap.

Influence of Gap on Behavior of Brazing Metals

Fig. 47 demonstrates that the distance of flow of brazing metal by ca-

Capillary Attraction and Wetting Action Explained

By H. M. WEBBER

Industrial Department, General Electric Co., Schenectady, N. Y.

o o o

pillary attraction is directly dependent upon the width of the gap, that the travel becomes greater as the gap diminishes, and that a uniform clean gap will give a uniform bond. Also, that a gap can become so wide as to completely stop the flow, and that line contact or non-uniform contact, rather than uniform contact throughout a joint, will result in a non-uniform bond.

A fact not illustrated here, but worthy of consideration when studying the behavior of brazing metals, is that viscous or pasty alloys will bridge wider gaps than will those of low viscosity. The temperature, nature and specific gravity of the liquid also are factors.

Fig. 48 and 49 have been prepared to illustrate in an exaggerated manner how the foregoing principle relating to gaps within joints can apply specifically to typical furnace-brazed products.

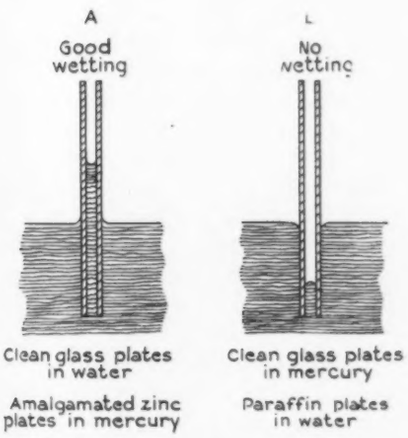


FIG. 45—Capillary attraction does some interesting though queer tricks. Between two clean glass plates immersed in water or ink, a column will rise because of wetting. Immersed in mercury, no wetting takes place, and the column is depressed. Paraffin plates in water, however, will behave like glass in mercury, and amalgamated zinc plates in mercury, like glass in water.

At *A*, Fix. 48, is shown a lever with hub prepared for furnace brazing in approved manner, with snug joints throughout. All corners are square so that they fit closely and leave no gaps. At *B* is shown how the copper creeps uniformly throughout all joints and leaves fillets at the extremities.

Gap Principle As Applied to Brazed Products

C shows a similar assembly with the exception that there is a gap at one corner within the joint, which might occur due to a rounded corner on one of the parts. *D* shows a fillet which has formed in this gap, and has prevented the brazing metal from bonding the rest of the joint.

E shows how a rounded corner in the hub, caused by a blunt tool, can keep the shoulder from fitting snugly against the lever, and in this way form a gap in which a fillet occurs, as at *F*, with no bond in the gap.

The principle illustrated in Fig. 48 applies to a large percentage of the assemblies prepared for electric-furnace brazing, and it is well to keep it in mind. Actually, very small gaps sometimes are responsible for the interruption of the flow of the brazing metal, and the cause of this interruption is not always apparent in a superficial examination. If the brazing metal does not flow through the joint, a gap is one condition to look for.

Fig. 49 illustrates at *A* the proper way to provide a sleeve fit in a typical assembly having a head pressed into a shell. With this arrangement the brazing metal will make a strong, tight, uniform bond. However, if the head is carelessly formed, as at *B*, only a line contact will result, and the bond cannot be depended upon for either strength or tightness. Best results can be counted upon from good workmanship directed to give uniformly snug joints.

Surface Condition of Parent Metal Important

In electric-furnace brazing the wetting action is a little different than in the case of water on glass, because we are dealing with metals at elevated temperatures and in most cases

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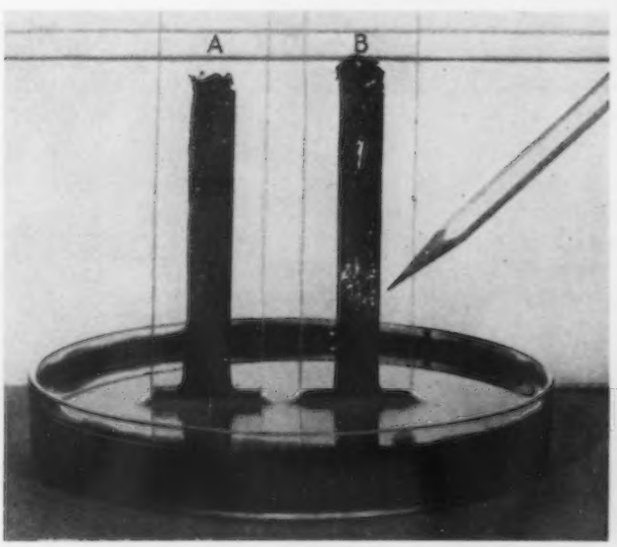

FIG. 46—India ink between strips of glass demonstrates capillary attraction and the desirability of having clean surfaces within joints of metal parts to be furnace brazed. At *A* is shown chemically-clean glass; and at *B*, fairly clean glass: note poor wetting of finger-printed area at end of the pencil point.

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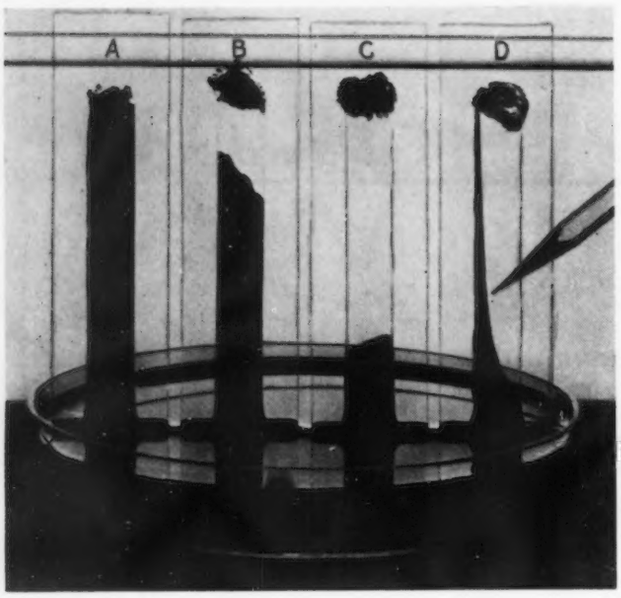

FIG. 47 — Effect of the width of gap between strips of glass upon capillary attraction. *A* shows intimate contact (no gap) throughout; *B*, uniform gap of 0.001 in. throughout; *C*, tapered gap, 0.020 in. at top, 0.000 in. at bottom; and *D*, tapered gap, 0.020 in. at right, 0.000 in. at left.

the attraction between the brazing metal and the parent metal is sufficiently great to cause alloying between the two. However, the condition of the surface of the parent metal has a great deal to do with the behavior of the brazing metal from the standpoint of wetting and the tendency to creep or to ball up. These tendencies depend upon the relative surface tension—whether there is sufficient attraction by the surface of the parent metal to draw the brazing metal out in a thin film, or whether the surface tension of the brazing metal is sufficient to draw it up into balls or lumps on the surface of the parent metal as compared with a lack of attraction by the surface to draw it out in a film.

One's first thought might be that the molten brazing metal would creep best on a highly-polished surface, but it can be said that exactly the opposite is true. The brazing metal will creep best and farthest on a clean roughened surface.

For instance, molten copper will wet clean polished steel, but it will not have much of a tendency to creep out on its surfaces and distribute itself evenly in the presence of the protective atmosphere in the furnace. However, if this surface should be roughened by shot blasting, rough grinding, rough machining, pickling, or some other process, the copper will spread out in a thin film and tend to distribute itself evenly over the surface. This is because the liquid is drawn through the tiny scratches and pores on the surface by capillary attraction. The reader can easily demonstrate this effect for himself, and other phases of the wetting action, with some ink and several grades of paper.

Ink and Paper Analogy of Wetting Action

Fig. 50, for example, illustrates the wetting action of ink on five different grades of paper, which although not identical in performance with respect to brazing metals on parent metals, can be somewhat likened to certain conditions encountered in electric-furnace brazing. Studying the wetting action in this manner will at least give one a better understanding of some of the results obtained with the furnace-brazing process.

A drop of ink was placed on each of the ten pieces of paper shown, while all were in the horizontal plane, and then the back panel was raised ninety degrees into the vertical plane. This allowed the ink to creep out or draw together on a horizontal surface, or to cling or flow downward by force of gravity on a vertical surface, if it so desired.

Effect of High Mutual Solubility

A is a piece of blotting paper. The ink soaked into it almost instantaneously upon striking its surface, and was so completely absorbed by the body of the paper that it was unable to spread. This can be likened to some extent to the action of copper on nickel, relatively high-melting silver solder on copper, or similar combinations where the metals are mutually soluble to a high degree. Because of this great mutual solubility, it is usually desirable to supply a number of reservoirs of brazing metal to a joint when the parent metal is likely to absorb the brazing metal readily, rather than to expect the brazing metal to creep appreciable distances by capillary attraction—say ¼ in. or more. This can be accomplished by machining one or more grooves in the tenon to retain wire rings; by drilling feeder holes to the joint, filled with slugs; or by including foil within the joint if practicable.

A, Fig. 50, does not illustrate, however, another effect of high mutual solubility of the brazing metal and the parent metal, namely the "freezing" of the brazing metal due to a pick-up of the higher-melting parent metal. This also retards the flow of the brazing metal and sometimes stops its penetration into a joint or leaves collections of it on the surfaces of the

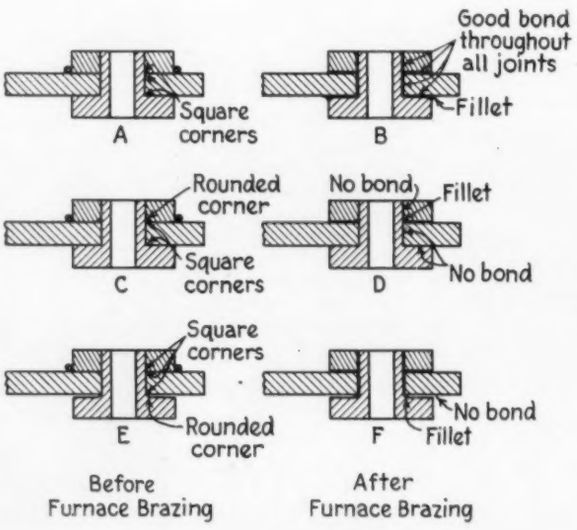

FIG. 48 — Uniformly snug contact throughout joint, as at *A* and *B* gives good bond throughout. Gaps in joints, as at *C*, *D*, *E* and *F*, interrupt capillarity and result in incomplete bond.

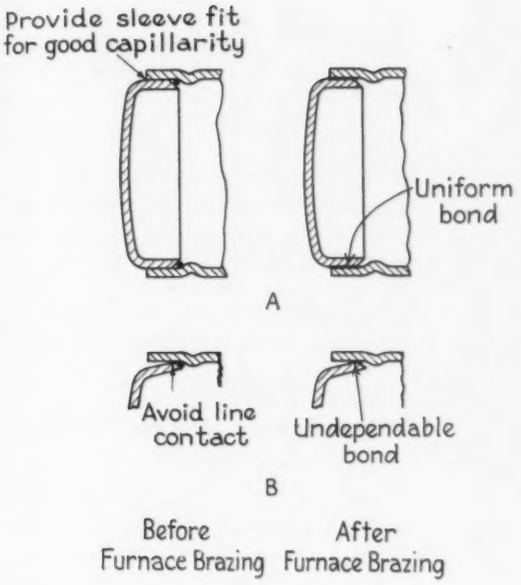

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FIG. 49—Here, too, a uniformly snug contact throughout the joint, *A*, will give a strong, tight bond. However, with only line contact, *B*, or spotty contact, neither strength nor tightness is to be expected.

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parts instead of allowing the excess to creep out freely into a thin film.

High Creep Ability

B is a piece of facial tissue paper, noted for its highly absorbent properties. Because it is extremely thin, very little ink was required to soak through it, and the remainder has spread widely because of the capillary attraction. This can be likened to the action of copper on clean low-carbon steel with a matte finish, where the copper is only slightly soluble in the steel and penetrates only "skin deep," but has great ability to creep on the surface by capillary attraction. In like manner, copper plating on such a matte surface will tend to retain its even distribution in the furnace-brazing cycle.

C is a piece of poster-board (a grade of cardboard) which was readily wetted by the ink but neither absorbed it all nor drew it out over its surface. The surface tension of the ink held the drop in position even in the vertical plane. Copper or silver solder, for instance, sometimes behaves in this manner on steel if the wetting action is not quite right, caused by unclean surfaces, impure furnace atmosphere, insufficient flux, etc.

D is a piece of bristol board, another grade of cardboard. Although it was wetted by the ink, the ink drew itself together instead of creeping out in the horizontal plane, but the surface tension of the ink was not sufficiently great to hold the drop intact in the vertical plane, which resulted in downward flow. This action can be likened to some extent to copper on highly-polished low-carbon steel, where it is sometimes found that the brazing metal gets beyond control and runs downward, forming collections which solidify on projections or on low portions of assemblies. Sometimes this property can be used to great advantage, while at other times it is better avoided.

Example of Poor Wetting Action

E is a piece of cellophane, which has very effectively resisted the wetting action of the ink, allowing the surface tension of the ink to draw the ink together into a small drop when resting in the horizontal plane, and to run freely down the vertical surface. This can be likened to the very poor wetting action of copper on steels which have protective surface films of oxides of chromium, manganese, vanadium, aluminum, or silicon, formed by impurities in the controlled atmosphere, and explains the necessity of preventing or removing such oxide films.

Copper electroplating on highly-polished low-carbon steel commonly balls up in the manner shown at *E*, in the furnace, making it difficult or impossible to retain a uniform coating of copper where desired. Copper behaves in this manner on steel surfaces in an impure protective atmosphere badly contaminated with excessive water vapor, oxygen, or carbon dioxide, compared with the amount of hydrogen or carbon monoxide present. The former have an oxidizing effect, while the latter have a reducing effect. With a badly contaminated furnace atmosphere the surface tension of the copper is relatively high compared with the negative wetting action on the oxidized surfaces of the parent metals, which causes the copper to ball up or run away. In a highly reducing atmosphere the surface tension of the copper is relatively low compared with the good wetting action, which encourages the brazing metal to creep on the steel.

Oxidized Surfaces Avoided

Surfaces of low-carbon steel which are oxidized become reduced by the hydrogen in the furnace atmosphere at the copper-brazing temperature, leaving a clean white matte finish which serves as an excellent means for distributing the copper. Steels with oxidized surfaces are generally avoided

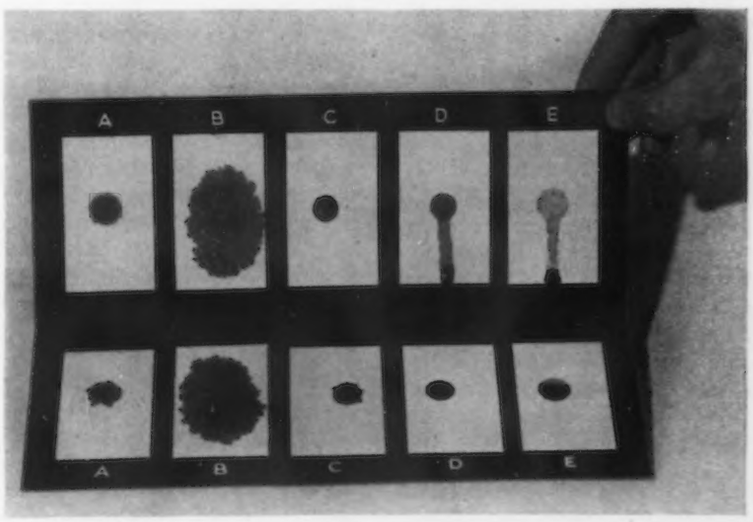

FIG. 50—Drops of ink on various grades of paper behave somewhat like brazing metals on parent metals with different surface characteristics. *A* is blotting paper; *B*, facial tissue; *C*, poster-board; *D*, bristol-board; and *E*, cellophane.

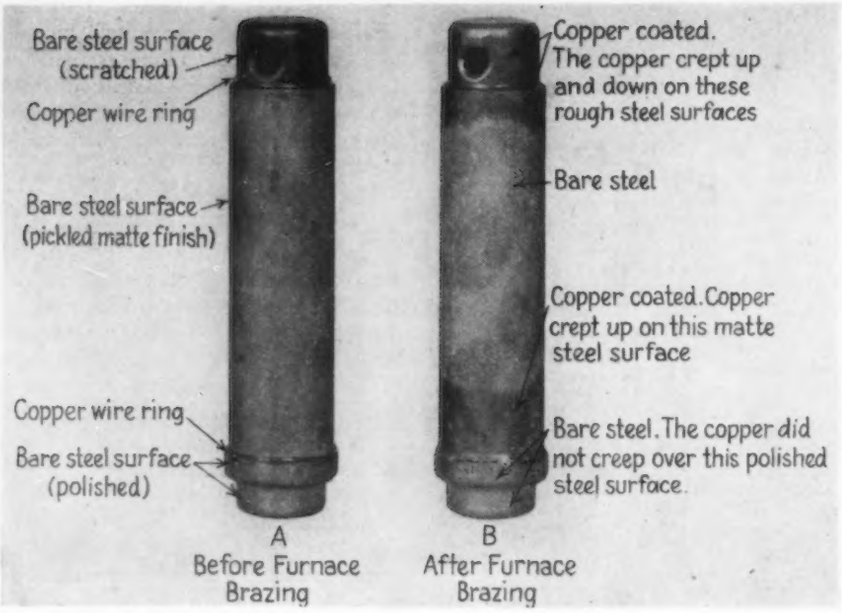
Bare steel surface (scratched)
Copper wire ring
Bare steel surface (pickled matte finish)
Copper wire ring
Bare steel surface (polished)
A
Before Furnace Brazing
Copper coated. The copper crept up and down on these rough steel surfaces
Bare steel
Copper coated. Copper crept up on this matte steel surface
Bare steel. The copper did not creep over this polished steel surface.
B
After Furnace Brazing

FIG. 52—The assembly at left, prepared for brazing, has copper wire rings at the joints. The view at right shows how the copper creeps on rough surfaces but not on smooth ones.

in making assemblies to be furnace brazed, however, because oxides within the joints are not so easily reduced as those exposed, and some trouble might be expected in getting a good bond.

Surfaces which are rusted will also be reduced in the furnace atmosphere. Parts which have been unintentionally exposed to the weather previous to their furnace brazing, and as a result have become rusted, are not necessarily spoiled. Cases have been known where such assemblies have been successfully electric-furnace brazed with no apparent ill effects. Here again the reduced oxides form a matte finish which readily holds and draws the copper. More copper than usual should be applied to such assemblies during preparation, to provide for its absorption by the matte surfaces as well as the joints.

Effects of Surface Condition on Creep of Copper

The effects of the surface condition on the creep of copper on actual furnace-brazed assemblies are illustrated in Figs. 51 and 52. In Fig. 51, the assembly *A* was made of a section of hot-rolled bar stock, copper brazed to a punching of cold-rolled steel. The assembly *B* was similarly made except that the bar was rough-machined before assembling instead of having the rough-oxide surface as at *A*. Preparation for brazing consisted of placing copper-wire rings around the bars near the joints at the bottom. The two assemblies are shown as they came from the brazing furnace.

Assembly *A* is completely covered with copper, the molten metal having been drawn upwards a distance of 4 in., then horizontally across the rough-cut top which is 2 in. in diameter. The mill scale on the surface of the bar has been reduced by the hydrogen in the furnace atmosphere, leaving pure iron which has been impregnated with the copper and can be seen in the illustration as having the same rough surface as the original iron oxide. It will be observed that practically no copper fillet is left at the joint because the copper has been drawn away. There was ample copper, however, to supply the needs of the joint because the assembly *A* is as well bonded as *B*, which has a noticeable fillet at the joint. The copper crept upwards about 1½ in. on the rough-machined steel bar *B*, and left an outline which can be seen in the illustration. If the bar had been finish-machined the upward creep would have been but a short distance, and if it had been polished this upward creep would have been nil.

Fig. 52 shows an assembly before and after being furnace brazed, *A* and *B*, respectively, on which the copper did not creep on polished surfaces but crept readily on the adjoining pickled and scratched surfaces. The cup at the top had been scratched in the die, leaving tiny grooves which have drawn the copper upward, *B*. The pickled surface of the tube, *B*, has drawn the copper downward from the joint at the top and upward from the joint at the bottom. However, the cap at the bottom, being made of well-finished cold-rolled steel, has a polished surface which has not been scratched in the die, and instead of running down over the polished surface the copper has clung in a fillet at the joint, and has also crept upward on the pickled tube. The copper has also, of course, crept into the joints by capillary attraction.

Clean Surfaces Give Best Wetting Action

For best wetting action the surfaces of assemblies should be perfectly clean. Heavy oil or drawing compounds should be removed, such as by a hot caustic wash, or by a vapor "degreaser." Carbon tetrachloride is occasionally used for cleaning parts. Light oil can sometimes be left on the parts, particularly if the oil distills readily and leaves no carbon deposit which would hinder wetting. For particular work, however, even light oil should be avoided if possible.

Dirt on the assemblies or within the joints is, of course, objectionable because the condition is not improved either by the heat or the reducing atmosphere and it hinders the wetting action.

Lead-bearing lubricants particularly should be avoided because in general their presence completely prevents the creep of brazing metal into the joints. Bars, rods, and tubing previously rolled or drawn with such lubricants have a skin which offers poor response to the wetting action and this skin should be ground, machined, or scaled off before employing such stock in assemblies which are to be electric-furnace brazed. Furnace-brazed joints with lead in them are extremely weak and brittle.

Surfaces Shot Blasted

From the wetting standpoint, sand-blasted surfaces have been found to be much less satisfactory than shot-blasted surfaces, the explanation being that sand particles embed themselves within the surface. Consisting of silica, the embedded sand particles repel the molten copper and impair the wetting action on the steel surface.

Shot-blasted surfaces, on the other hand, are easily wetted because the abrasive, if clean, consists simply of iron. Care should be taken, however,

to see that only clean shot or grit is used, free from the foreign materials which are likely to be mixed with it if it has been previously used for other jobs, such as removing porcelain enamel.

When grinding surfaces of parts to be brazed, care also should be taken to see that the coolant is clean and free from impurities in order to assure that the finished surfaces will not have these impurities ground into them.

Furnace Time and Temperature Affect Wetting

The temperature of the furnace naturally has an important effect on the wetting action, because the wetting and alloying action improves as the temperature increases. Of course the temperature must be above the melting point of the brazing metal, and below the melting point of the parent metal. Within this range a temperature is generally selected which will give the best satisfaction from an overall standpoint. Some manufacturers, for example, copper braze low-carbon steel assemblies at as low as 2000 F (copper melts at 1982 F), while others copper braze tungsten-carbide-alloy bits to steel shanks at temperatures up to 2250 F. Perhaps most users copper braze at 2040-2100 F.

The time in the furnace also affects the wetting action, particularly with respect to the distance of creep of the brazing metal. If there is a tendency to creep, the distance generally will increase with time.

The alloying action between brazing metal and parent metal is, of course, a function of both temperature and time. In general, for production work, both temperature and time are kept at a minimum consistent with good quality.

Oxides Removed by Flux

Oxides which form on the surfaces of parent metals or brazing metals and hinder wetting, usually can be removed satisfactorily if a suitable flux is applied during preparation for furnace brazing. If this is done, a flux should be chosen which will melt and become active at a temperature lower than the melting point of the brazing metal, so that the flux will remove the oxides and provide clean surfaces when the brazing metal melts and is ready to wet them. Wherever possible, for best results, the flux should be spread uniformly over the surfaces to be wetted, before assembly, instead of requiring that the flux run into the joints from the outside by capillary attraction. Also, it should cover uniformly the brazing metal if the latter is subject to oxidation in protective atmospheres, due to the inclusion of some such element as zinc, which oxidizes readily.

(TO BE CONTINUED)

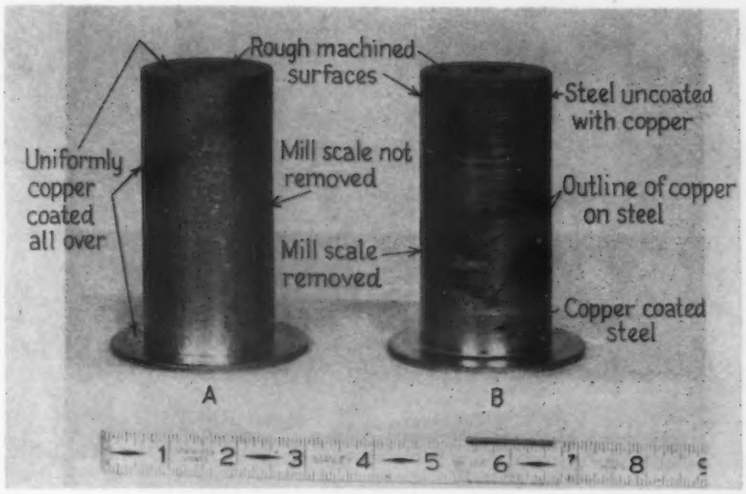

FIG. 51—These two furnace-brazed assemblies reacted differently to the creepage of copper because the one at left had its original mill scale while the one at right had a machined surface.

G-E Builds Addition to Turbine-Gear Shop

CONSTRUCTION of a new large crane bay on the western end of the present gear-cutting shop at the River Works of the General Electric Co., will be completed Nov. 1. This new building, which will provide a great deal more floor space and additional machinery for the marine-gear division, has a completely welded steel frame and is of non-combustible construction throughout. It will be 92 ft. wide by 180 ft. long inside, and will be 42 ft. high clear, with an overall height of 63 ft. It will be used for the manufacture of large machine reduction gear rotors up to 16½ ft. in diameter and many tons in weight.

Features of construction include use of a special glass in the north and south walls to admit light but exclude the heat of sun rays. Brick with hollow tile will back windows of double glazed construction. It is stated that construction of this type will provide insulating air space equivalent to a 16-in. brick wall. Upper windows will be hollow glass blocks for a height of 5 ft. 3 in., continuous over the length of the building.

A 50-ton overhead electric traveling crane with all modern equipment, including creeping control to facilitate careful handling of large gear rotors, will be installed to service the entire floor area. A heating and temperature control system that will provide the uniform temperature essential for the department's work is planned. A process of mixing fresh air and recirculated air will be automatically controlled by thermostats.

D. R. Yarnall Heads Engineering Trustees

D. ROBERT YARNALL, chief engineer, Yarnall-Waring Co., Philadelphia, has been reelected president of United Engineering Trustees, New York, of which the Engineering Foundation is the research organization. Other officers were named as follows:

Henry A. Lardner, J. G. White Engineering Corp., New York, first vice-president; Albert Roberts, secretary, Minerals Separation North America Corp., New York, second vice-president; H. R. Woodrow, vice-president of the Consolidated Edison Co., New York, treasurer; J. P. H. Perry, vice-president of the Turner Construction Co., New York, assistant treasurer. John H. R. Arms continues as secretary.

Pre-Planning—The Key to Handling

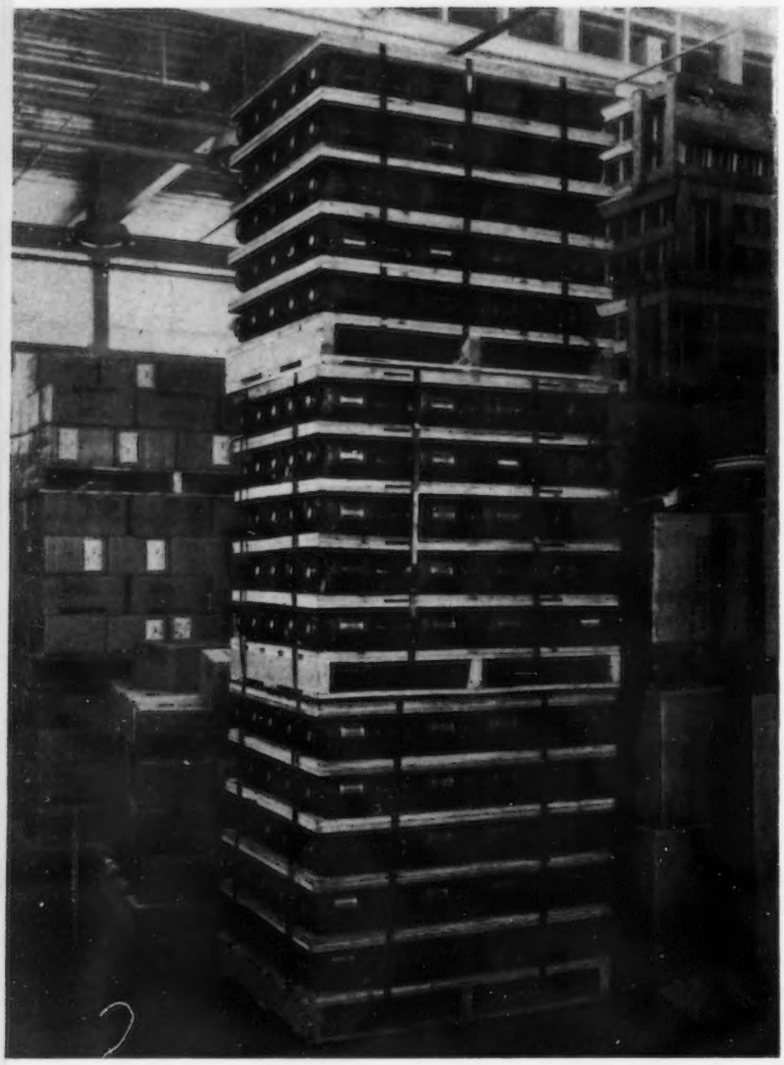

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FIG. 2 — Washing machine motors packed in units of 100 before shipment to Bridgeport.

o o o

IN 1936, because of demands for increased capacity, it became apparent that General Electric's manufacture of washing machines must be moved to a new site in the Bridgeport works. A preliminary survey of the products to be handled and of the layout of the building to be occupied showed that scientific study and pre-planning of potential materials-handling problems would pay real dividends. True, earlier home-laundry manufacture had given some consideration to floor layout in relation to handling of materials, but the prime consideration had always been the location of the manufacturing equipment itself — with only passing regard to economical movement of materials. Although chutes and conveyors had been generously utilized and bulkier parts had been stored on a mezzanine floor so that they could be fed down to the assembly lines, this preliminary survey showed that there were further possibilities for improvements.

At about this time the company was beginning to focus much attention upon materials handling. An interworks committee was coordinating the efforts of individual plants. A general materials handling committee in each plant was concentrating upon the local situation. And even the home laundry

o o o

FIG. 3 — Former method of handling and storing gear cases in bulky cartons.

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Economies

By C. H. BARKER, JR.

Supervisor of Production Appliance and Merchandise Department, General Electric Co., Bridgeport, Conn.

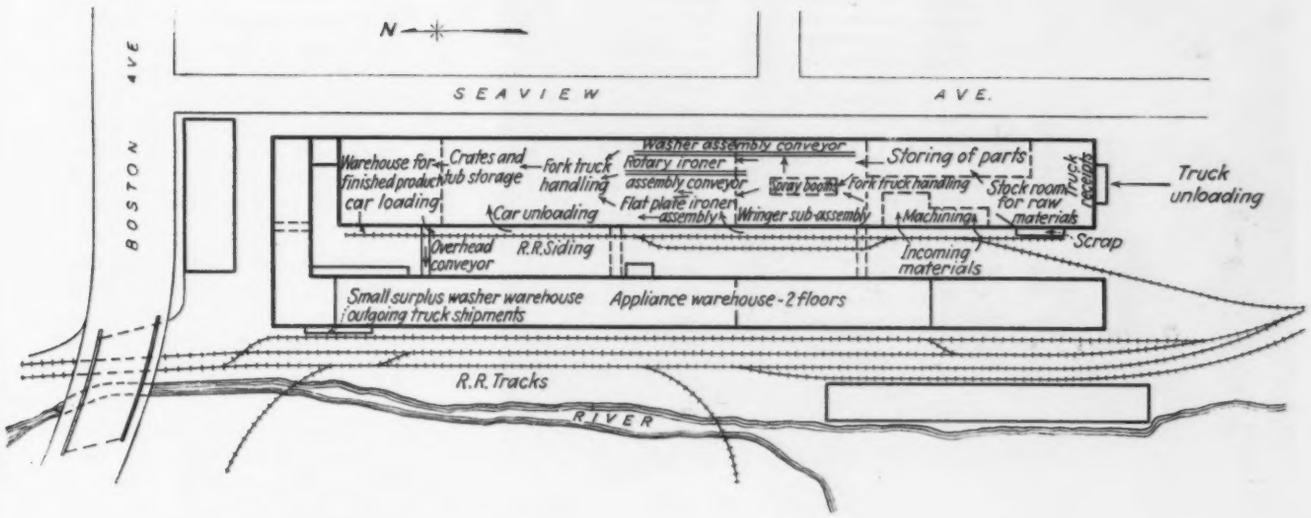

FIG. 1—Schematic layout of department at Bridgeport Works for fork truck and conveyor assembly handling.

equipment section in Bridgeport had formed its own committee for specialized study of its own problems.

Before moving to the new washing-machine manufacturing quarters, a complete study of the building was made. First, it was decided to lay out the building with just as much emphasis on economical materials handling as on the location of strictly manufacturing equipment. Plans were made to locate stocks so they could be consumed most economically. Space for different stocks was allotted with an eye to minimizing the total fabrication job.

The new location had high ceilings, so that tiering of pallet loads, with the aid of fork trucks, was indicated. On the other hand, it was seen that handling equipment must be easily portable and flexible to facilitate moving the varied units comprising the finished product.

With the exception of the main assembly conveyor lines, it was decided that fork trucks, in conjunction with scientifically designed pallet loads, would form the basis of all materials handling.

Main aisles were established and the layout was completed in accordance with Fig. 1. All the bulkier items of raw material and work-in-process—such as tubs, crates, motors, gear cases,

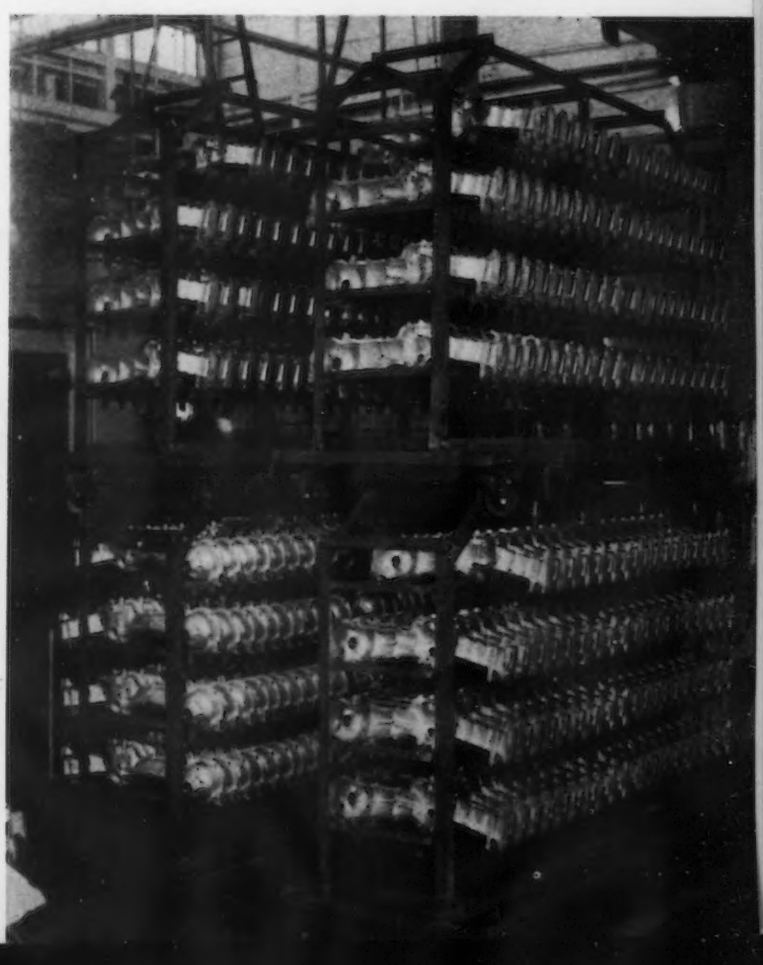

FIG 4—New method of handling and storing gear cases on portable racks.

FIG. 5—Sixty completed tub covers handled as a unit on a portable rack.

cover disks, skirt and leg assemblies, and a variety of steel items — were studied in detail. This study included all aspects of receiving the material. It was necessary to take cognizance of the different problems involved when materials came in from vendors on pallets, when they were placed on pallets after receipt at Bridgeport, when they were to be moved by truck, and when they were adaptable to fork-truck handling. It was seen, with but one or two exceptions, that everything could be moved by fork trucks—particularly if adequate auxiliary equipment could be developed. Next the optimum location, the allotment of required spaces, and the complete handling operations were established. In all cases, accurate time studies were made and absolute cost records of all known handling methods were made.

Examples of Improvements

Washing machine motors, manufactured at another G-E plant, are packed in units of 100 (Fig. 2) before being shipped to Bridgeport. Further, these motors are kept in unit load until deposited on the washing machine assembly line. A fork truck does all the handling of the 2450-lb. load. The special pallets and separators are accumulated and returned to the motor-manufacturing plant after the motors have been incorporated in the finished washing machine.

Fig. 3 shows the old method of handling and storing gear cases while in process. They were received in bulky cartons—which had to be opened, emptied, and disposed of.

Today another method is used. Fig. 4 indicates the savings. Upon completion of inspection of the gear cases at the vendor's plant, approximately four miles from the G-E shop, cases are placed on these portable racks and transported by street truck. In addition to this immediate "unit-forming" advantage, such racks serve other purposes. Rollers make it easy to push them short distances by hand; they can be handled or tiered by use of fork trucks.

Similar racks have been developed for other units such as wringer assemblies.

Completed tub covers may also be placed in such racks. Sixty covers may now be moved as a unit (Fig. 5).

Activators presented a problem to the materials-handling men. Even after pallets were initiated, the unusual

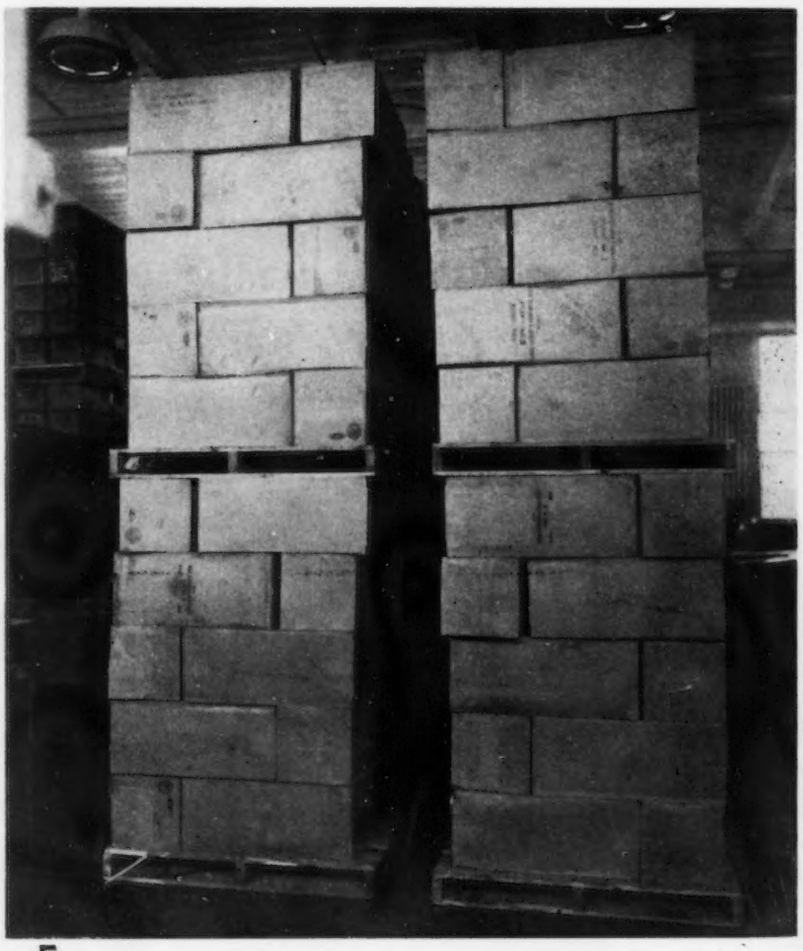

FIG. 6—Pallet unit-loads of activators as previously received from the vendors.

shape and size of the units made packaging and handling difficult (Fig. 6).

Fig. 7 shows pallet units of activators as they are received from vendors today. For storage purposes, one unit is tiered on four corner spindles of another pallet unit. All piles of activators except the four corner ones are held in place by means of spindles about 1/3 the length of the corner spindles, with a wooden collar surrounding the necks of all the activators on the top level.

Surprisingly simple packs can be designed for handling odd-shaped parts with a little study. To the left of the activators in Fig. 7 are standard tote boxes of work-in-process parts on pallets. It is good practice to establish standard box quantities for all standard parts and either store a definite quantity of sets of parts for an assembly on one pallet or confine the use of one pallet to a particular part or subassembly.

An unusual system of making deliveries to the assembly lines has been developed recently. Numbers have been assigned to all delivery stations, and the truck operators know what quantities of what parts go to each station. The frequency of the deliveries, in effect, is based on the scheduled daily output. If an operator sees he is going to run out of material, he throws on a switch which turns on a green light in the aisle by the station-number sign. The truck operator, after making the delivery, switches the conveniently located light off without leaving the truck.

At stations where very bulky parts —such as tubs and crates—are supplied, good use has been made of short lengths of roller conveyors. These conveyor lengths are fastened to the floor at right angles to the assembly line. They are long enough to hold two pallet loads so that when an operator finishes the material on the first pallet, he simply removes the empty pallet and pulls the second one into place, proceeding at his work without delay.

Live pressed-steel tote boxes, important for their part in tiering, were developed with the cooperation of one of the largest manufacturers of steel materials-handling equipment. The trend is definitely toward use of more of them, as new applications are found.

Finished products of the type produced in this plant either can be handled and stored on pallets, or, if the pack permits inserting each fork under the top of a crate, they can be transported and tiered in storage without the use of pallets.

The customary industrial applications of handling cumbersome dies between die storage and the presses and the moving of equipment during the expansion of ironer manufacturing facilities, fork trucks have afforded many intangible savings.

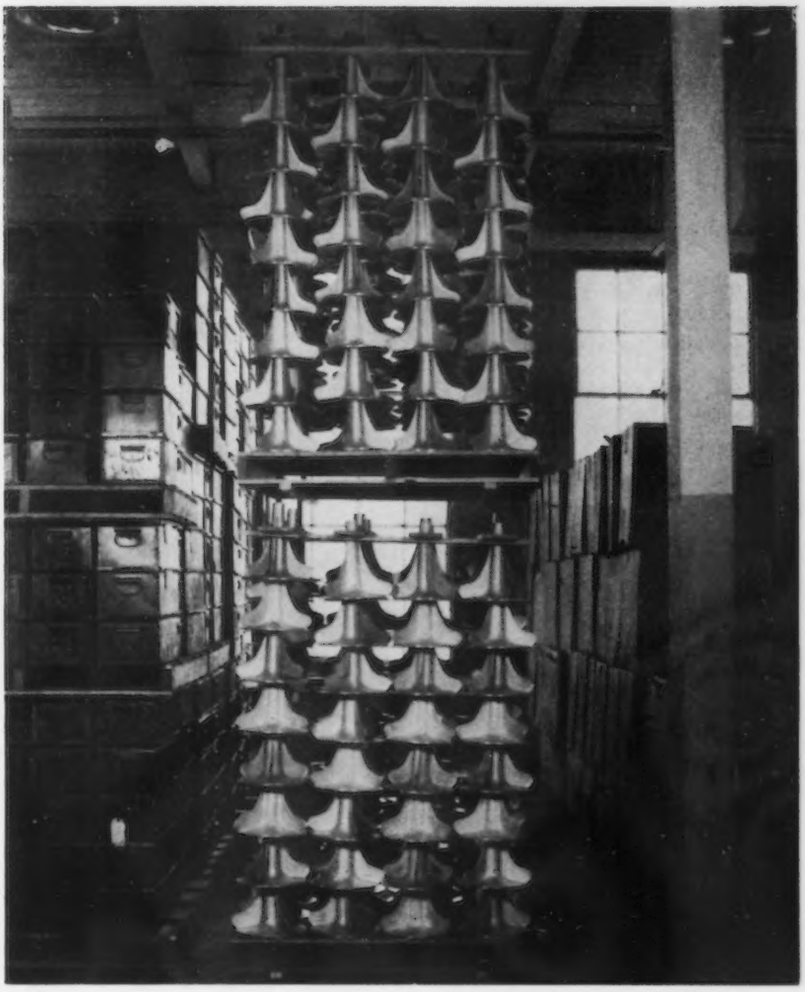

FIG. 7—Pallet unit-loads of activators as received from the vendors today.

Savings

Savings recorded fell into one of the following classifications: (1) saving in labor; (2) saving in space or better utilization of existing space; (3) decided reduction in spoilage; (4) higher utilization of manufacturing equipment; (5) better housekeeping; (6) greater ease in checking inventories.

New Iron and Steel Statistics Include Czechoslovakia

TO the latest edition of "Statistics of the Iron and Steel Industries," which covers 1937 and has just been issued by the British Iron and Steel Federation, valuable new tables have been added. These additional statistics cover Brazil, Czechoslovakia, and Canada.

The tables regarding Czechoslovakia are of special interest at this time, when much of that country's iron and steel industry is being transferred to Germany. They show that in 1937 Czechoslovakia had record outputs of pig iron and ferro alloys and of steel, the respective totals being 1,675,000 tons and 2,318,000 tons.

Czechoslovakia's exports aggregated 479,276 tons, a total second only to that of 1929. The largest purchaser was the Netherlands, with 48,797 tons. The United Kingdom's amount was 20,855 tons, while Germany was very low in the list with 8,928 tons. Czechoslovakia imported 8,113 tons from the United Kingdom and 11,057 tons from Germany, in a total of 75,364 tons.

Fundamental Engineering Data

CHAPTER 38 of a Series on the Methods and Equipment of Industrial Power Transmission.

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IN the general power transmission scheme, wherever belts are employed, the pulleys have nearly always been looked upon simply as a necessary evil. The belt itself has always been regarded as *the* power transmitting medium; the pulleys as mere accessories thereto.

This is hardly fair, when one considers how intimately the transfer of the power from driving to driven shaft is concerned with the shape, size, weight, general construction and frictional characteristics of the face of the pulleys employed. It may be conceded that the belt itself is the major problem, but the minor problem of pulley selection is so intimately and inextricably bound up with that major problem that pulley design *cannot* be ignored if the utmost economic values are to be derived from any belting drive.

The last chapter of this series dealt briefly with the characteristics of various types of pulleys, and suggested the principal conditions under which each type finds its major applications. Further consideration is given here to certain fundamental engineering factors affecting those applications.

Two of these factors are of primary importance; speed and surface grip. Two other factors are of lesser importance; weight and shape. And, finally, two are of distinctly minor importance under most conditions of service, yet must be considered carefully under other conditions; the drive-tension, and the method of fastening the pulley to the shaft.

All the engineering factors concerning pulley application and selection may be referred to one or another of these matters, and a clear conception of their importance should be of help in determining the economic values of this or that type of pulley in any given problem. The subject is not a difficult one, except that clear thinking in the matter is often unusual. It will be approached, therefore, from a somewhat elementary standpoint, in order to keep the reasoning on familiar ground.

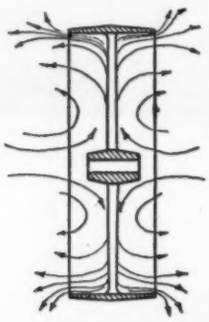

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FIG. 1 — Diagram to illustrate air turbulence caused by rotational movement of a pulley.

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AT RIGHT

FIG. 2—A Dodge heavy duty, split-steel pulley with malleable iron hub, showing detail of construction.

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The vital element in pulley speed is not the number of revolutions per minute of the pulley as a whole, but the speed of the pulley rim in feet per minute. Every pulley contains the principles of a flywheel. No matter how light it may be, it must have some weight. And because of that weight it stores energy while in motion; energy of a character which tends to act centrifugally, to burst the rim. The energy contained in any balanced rotating mass is calculable by the familiar WR^2 formula; that is, the product of the weight of the mass by the square of the radius of gyration (the radius of gyration in this case being taken as the distance from the center of the mass to the imaginary point at which, for mathematical purposes, the weight of the mass may be considered concentrated). It is evident, therefore, that the energy of the pulley varies not only as the total weight, but as the square of the radius of gyration. In a pulley of 2 ft. diameter the energy will be about four times that of a pulley of one ft. diameter at any given speed of rotation.

Again, a pulley of one ft. diameter will have a rim speed of 1 x 3.1416 x 500, or 1570.8 ft. per min., when the pulley is rotating at 500 r.p.m.; while a pulley of 2 ft. diameter at the same speed will have a rim speed of 3141.6

For Pulley Selection

By FRANCIS JURASCHEK
Consulting Editor, The Iron Age

ft. per min. But while the rim speed is merely doubled when the diameter is doubled, the forces tending to disrupt the rim are quadrupled. Thus, the higher the rim speed the greater is the strain put upon the pulley rim, and this strain must be limited by the material strength and construction.

The WR^2 formula as usually applied to pulleys can, for ordinary purposes, be simplified by neglecting the weight of the arms and hub, and considering only the weight of the rim. Then R^2 becomes the square of the *mean radius* of the rim; that is, one-half the sum of the squares of the inside and outside rim radii. The entire formula for computing the energy in foot-pounds is $E = \frac{WR^2 N^2}{5872.86}$ where N^2 is the square of the number of revolutions per minute of the pulley. Manifestly, the greater E becomes, the greater is the tendency of the pulley rim to burst due to the centrifugal action of this contained energy. But, assuming the r.p.m. remains constant, increasing the *size* of the pulley multiplies these destructive internal forces in geometrical ratio; hence the easiest way to set a practical limit to the safe speed of any pulley is to limit the rim speed.

Pulley rim speeds for solid cast iron pulleys should not exceed 4,000 ft. per min.; for split cast iron pulleys, 4,500 ft. per min.; for split-arm-at-joint construction cast iron pulleys, 5,500 ft. per min. For iron spider wood rim pulleys the rim speed should not normally exceed 6,000 ft. per min., but special construction iron spider wood rim pulleys may be run at speeds not to exceed 9,000 ft. per min. The safe rim speeds under normal operating conditions for steel split pulleys should not exceed 5,000 ft. per min., while special construction laminated steel

AT RIGHT

FIG. 4 — Steel rimmed, iron spider, flanged pulleys on a paper-machine drive. The leather-link belt is seldom seen nowadays.

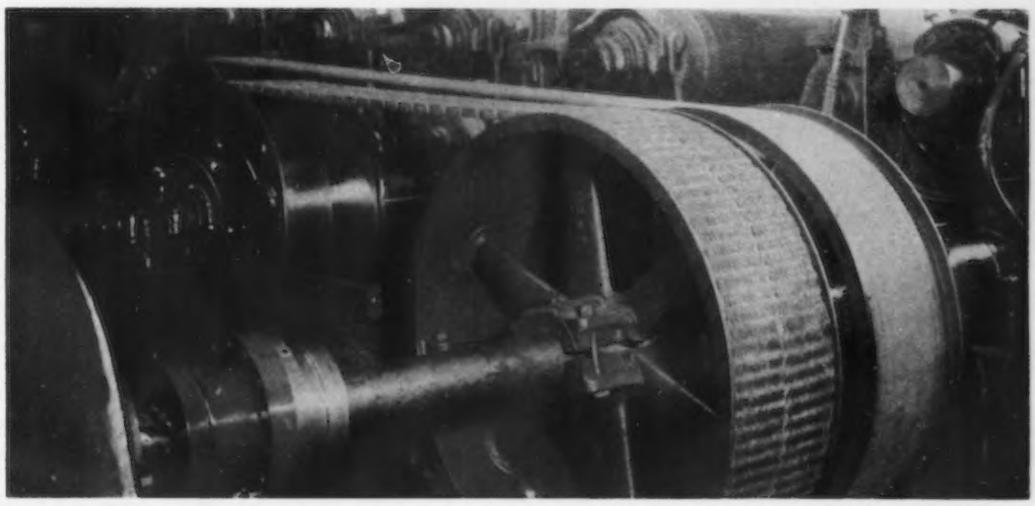

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FIG. 3—A Reeves all-wood drive pulley, showing detail of multiple-arm construction.

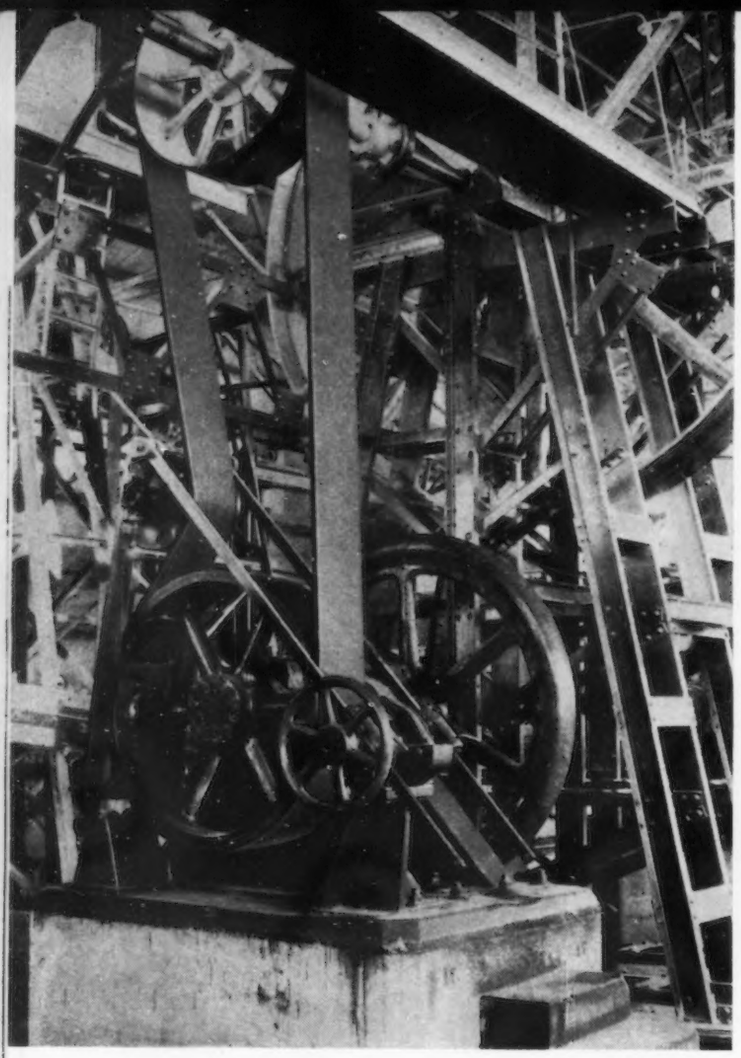

FIG. 5—Below, a heavy cast iron pulley for flywheel effect: above, a light pressed steel pulley on the transmission shaft.

pulleys may have a safe limit as high as 12,000 ft. per min. For solid wood (laminated construction) pulleys, 5,000 ft. per min. is usually accepted as the safe limit; for pressed fibre paper pulleys, 5,000 ft. per min.; for laminated compressed paper pulleys, 6,000 ft. per min.; and for compressed wood (Sprucolite) pulleys, 6,500 ft. per min. These are all *safe* speeds under normal operating conditions; for brief periods they may be exceeded; and it is of record that large iron spider wood rim pulleys have been used successfully at sustained rim speeds of in excess of 29,000 ft. per min.

Windage Losses

Still another item which has a direct connection with pulley speed is the item of windage losses. Windage may be defined as the loss in power transmitted caused by the drag of the air turbulence due to the fan-effect of the pulley. This turbulence is created in two ways; by the rush of the outer rim surface of the pulley, and by the churning of the air by the arms connecting the rim and the hub. These effects are roughly indicated by the sketch in Fig. 1. Both effects are negligible at low pulley speeds, but at high speeds may easily become of major importance.

The rim turbulence begins to be appreciable at rim speeds over 2,500 ft. per min., and increases as the square of the speed. That is, if the speed is doubled, the horsepower losses due to this effect are quadrupled. The design of the pulley will have little effect here, since the loss is caused by the rim surface, and all rim surfaces are more or less alike.

The arm turbulence varies considerably with the design and construction of the pulley, and especially of the arms. It is greater in a pulley where the ratio of diameter to face width is large, and less as the face width becomes equal to or greater than the diameter. (An overhanging rim cuts down the volume of movement of the air churned by the arms, but at the same time increases the windage loss due to rim turbulence.) The loss of energy due to the fan-effect of the pulley arms increases as the cube of the pulley speed; that is, when the pulley r.p.m. is doubled, the arm turbulence losses are multiplied by eight.

Robert Drake tested six different types of construction of pulleys, and found that the total windage losses of the type having the greatest losses,

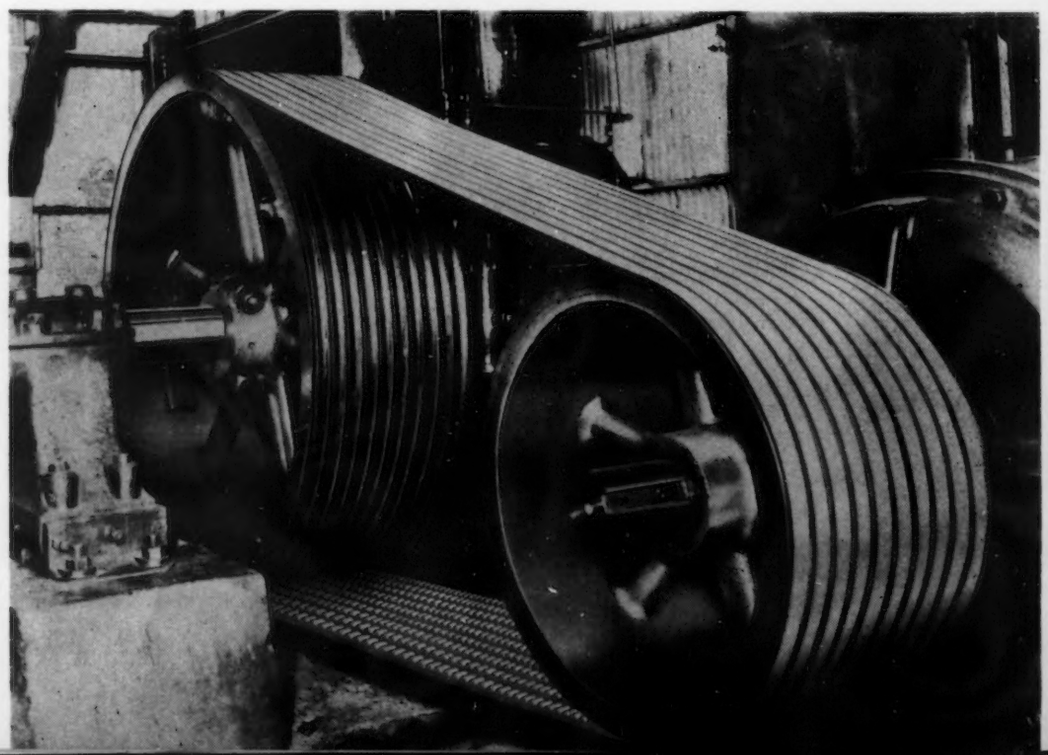

FIG. 7—Cast iron V-belt pulleys with Dayton cog-belt driving a large press.

at 3,000 ft. per min. rim speed, was five times as great as the type having the least losses when the ratio of face to diameter was 1 to 6; while in the case of pulleys having face-to-diameter ratios of 1 to 1, the maximum windage loss of the type having the greatest loss was only 1½ times that of the type having the least loss, operating at the same speed. Drake says that pulley windage losses are unimportant where the rim speed is less than 2,000 ft. per min., but that where belts operate at 4,500 to 5,500 ft. per min., as on metal grinding and woodworking jobs, windage losses may run to 2.5 to 3.0 per cent of the total input power. Drake is also sponsor for the following table, showing the great increase in total windage losses due to increased speed in the case of a 72 in. diameter by 14 in. face steel pulley especially designed for low windage loss:

Rim Speed, f.p.m.	*R.p.m. of Pulley*	*Windage Loss in Hp.*
2,000	106	0.07
3,000	159	0.22
4,000	212	0.53
5,000	265	1.00
6,000	318	1.76

Surface Grip

The resistance to slipping of any two areas in contact is the product of the normal pressure between these surfaces, p, and the coefficient of friction. f. That is, the frictional resistance offered is $F = pf$

But the coefficient of friction in the case of a belt and a pulley must be taken as the mean between the coefficient of friction of the belt surface and that of the pulley surface. Leather belting may be taken as varying between 0.27 and 0.60 for oak tannages, and between 0.50 and 1.10 for mineral tannages, while rubber belting varies between 0.30 and 0.60, according to the type considered. At average tension in the belt (say 100 pounds) and allowing one per cent slip between the belt and the pulley at full load, it may be assumed that the following general average coefficients of friction will hold for the pulley face; cast iron, 0.46; laminated wood, 0.56; laminated paper, 0.76.

Under normal conditions, then, a well worn-in, oak-tanned leather belt with a friction coefficient of 0.50 operating at 100 lb. tension and at 2000 ft. per min. belt speed over a cast iron pulley with a friction coefficient of

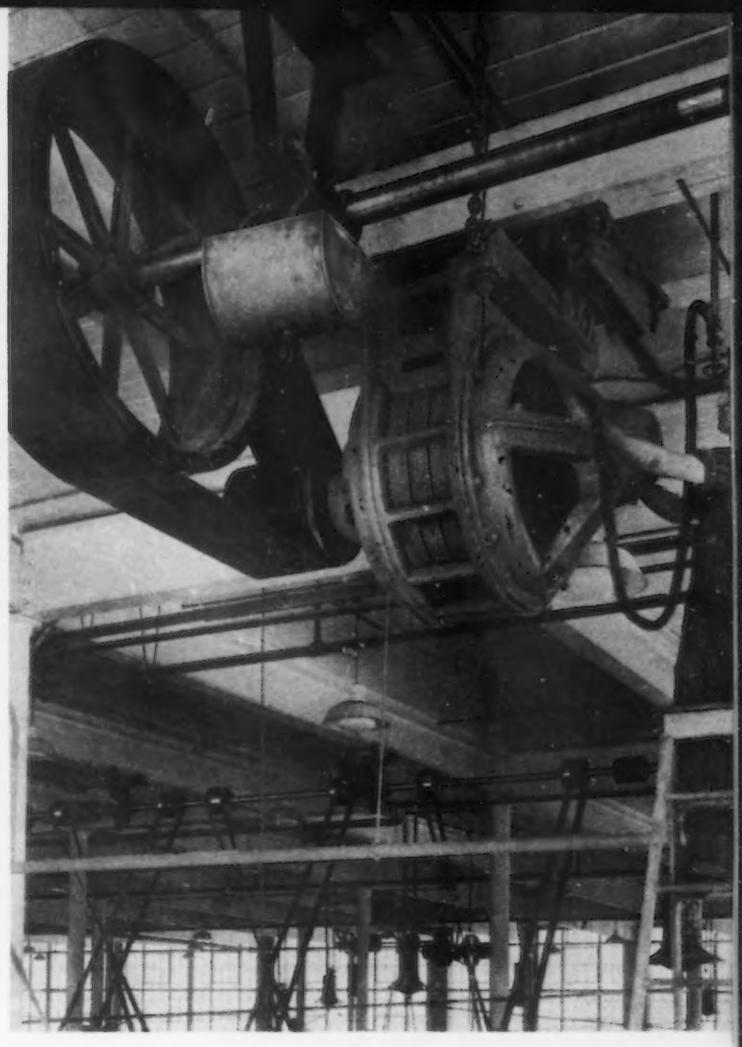

FIG. 6 — Typical Rockwood drive hung from ceiling; small paper pulley on motor shaft, and large iron pulley on transmission shaft.

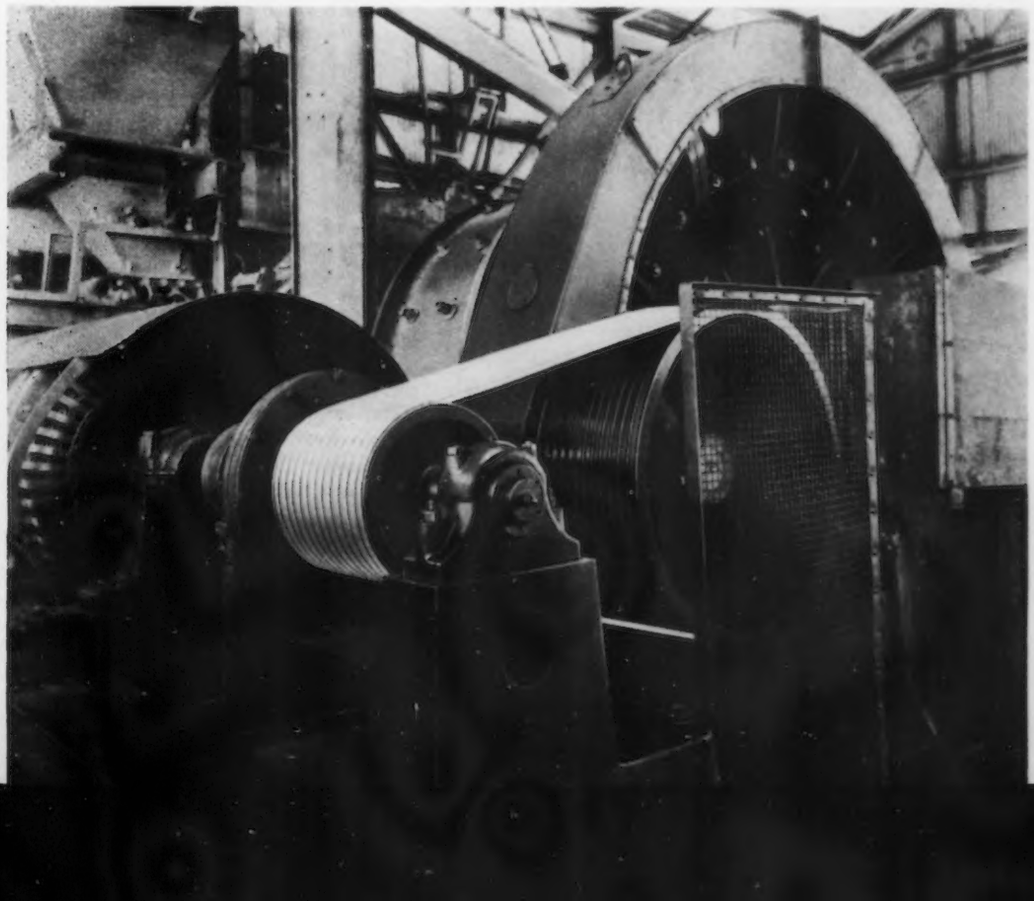

FIG. 8 — An Allis-Chalmers, texrope drive, illustrating a short-center, high-capacity application of the V-belt principle.

0.46, will develop a resistance to slipping of $100 \times \frac{0.50 + 0.46}{2}$ or 48 lb. per sq. in. of area of arc of contact.

The significance of this point cannot be appreciated until the whole matter is stated in a different way. Consider once more the equation, $F = pf$. It must be evident that for any required value of F, p or f may vary inversely with respect to each other. That is, a high value of p requires only a low value of f; and conversely, a high value of f requires only a low value of p. This latter statement is the nubbin of the argument. If the coefficient of friction between the belt and the pulley may be made *high*, the tension in the belt may be kept *low*. If the evil effects of tight belts be granted, then that combination of belt and pulley which gives the highest coefficient of friction will permit the operation of the drive at the least belt tension, other things being equal. These other things may, for most practicable purposes, be summed up in the arc of contact of the belt and the pulley, and the speed of belt travel in feet per minute. Manifestly, the greater the arc of contact, the greater the total area of belt and pulley surfaces in contact with each other, and the greater the total resistance to slipping; whence we arrive at an expression for a working limit for arc of contact. Normally, the least arc of contact on the smaller pulley should be not less than 120 degrees. For less than this value the slipping increases very rapidly. If the horsepower transmitted at 180 degrees arc of contact (both pulleys having the same diameter) be taken at 100 per cent, the horsepower transmitted at 120 degrees arc of contact will vary from about 75 to 87 per cent, according to the coefficient of friction between the two surfaces.

But the speed of the belt likewise enters the problem. At high belt speeds centrifugal force must be considered. This tends to throw the belt away from the pulley face throughout the entire arc of contact, thus breaking the frictional grip and permitting a large increase in slip. To a small extent this is compensated for by increased tension in the belt, but not entirely. Thus still another limiting factor is derived. Under normal conditions and with the usual types of belts and pulleys, belt speeds of about a mile a minute should not be exceeded. Lesser speeds will transmit more horsepower by slipping less.

As has been intimated, under normal operating conditions a pulley which weighed nothing at all would be ideal. Since it must have weight to have strength, it may thus be inferred that the pulley which combines the least weight with the requisite strength is the ideal to be desired. But the attainment of the least weight with great strength must not sacrifice other characteristics, such as coefficient of friction. And, at times, it may be highly desirable to bring into play the flywheel, or WR^2 effect of a pulley, in which case weight must be kept in mind.

Weights of pulleys increase materially as sizes increase, and not in direct proportion. Most equipment makers' catalogues give pulley weights for each size. For quick reference the following figures are illuminating:

Solid Cast Iron Pulleys

6 in. diam. 4 arm pulley weighs 2.5 to 3 lb. per in. face width from 6 to 10 in.
12 in. diam. 6 arm pulley weighs 6 to 11 lb. per in. face width from 11 to 74 in.
18 in. diam. 8 arm pulley weighs 9 to 20 lb. per in. face width from 76 to 84 in.

All-Wood Pulleys

24 in. diam. pulley weighs 5 to 6 lb. per in. face width from 4 to 24 in.
48 in. diam. pulley weighs 20 to 15 lb. per in. face width from 4 to 18 in.
72 in. diam. pulley weighs 46 to 34 lb. per in. face width from 6 to 24 in.

Wood Rim, Iron Center Pulleys

8 in. diam. pulley weighs 7 to 4 lb. per in. face width from 3 to 6 in.
24 in. diam. pulley weighs 18 to 15 lb. per in. face width from 3 to 22 in.
48 in. diam. pulley weighs 36 to 38 lb. per in. face width from 6 to 40 in.
72 in. diam. pulley weighs 68 to 82 lb. per in. face width from 6 to 40 in.

As may be seen, pulley weights vary both as to the material and as to the size. The larger the size and the heavier the weight, the more must the WR^2 or flywheel effect be considered. It takes considerable energy to put a heavy pulley in motion, and, likewise, once in motion, considerable resistance must be overcome in bringing the drive to rest once more. On certain types of machinery this is obviously of advantage; for transmission pulleys on lineshafts it decreases the overall efficiency of the drive by using up power.

The shape of a pulley rim (that is, whether it be crowned or flat) has a distinctly minor influence on the drive efficiency. But the shape of the pulley body may seriously affect the windage losses at high speeds. The less the arms are shaped like paddles, the less will they stir up air-turbulence, and the more the rims overhang the arms, even when those arms are paddle-shaped, the less the turbulence effect. In other words, where it is possible to design the pulley shape to decrease windage losses, such a pulley will transmit more power at high speed operation. This applies of course to large diameter pulleys, for the usual small diameter pulleys have solid webs and do not occasion pronounced windage losses.

In the matter of drive-tension, all that can be done is to make sure that the web or arms are so designed and constructed that they will not fail under abnormal drive-tension conditions, as in starting a cold or stiff machine under full load, or in resisting sudden loads, or in meeting a condition where the driven machine stalls. This is of most serious consequence in the case of large diameter pulleys, where compromises must be effected between the strength and rigidity of the members connecting the hub and the rim, and the matter of overall weight.

The means adopted of fastening a pulley to its shaft may be classified under two heads, compression and keying. Compression fastening is only used where the loads are light and speeds relatively low. The bore is a fairly close fit with the shaft, and the pulley hub is made tight on the shaft by drawing up on bolts which squeeze the hub tightly onto the shaft. The more usual method of fastening is by means of a key, or wedge-shaped piece of metal, fitting partly into a groove in the pulley hub and partly into a groove in the shaft. This makes a positive engagement suitable for heavy loads and high speed operation.

V-belt pulleys in small and medium sizes are generally made of pressed metal, and in large sizes of grooved cast iron or wood. The pressed metal pulleys are frequently made in sections, so that a pulley may be assembled of any number of sections to meet the needs of the number of belts in the drive.

The principal factors to be considered here are weight and strength. The stock designs are all definite compromises between these two factors, purposely made so in the endeavor to give the maximum strength with the least weight. It is advisable in selecting any V-belt pulley to consider not only the normal operating loads it may be called upon to bear, but also the shock or starting loads it must equally resist. And finally, the V-grooves should have *smooth* sides, for rough groove sides will quickly ruin any V-belt; the alinement of bore with rim must be true, in order to run without wobbling; and the whole pulley must be reasonably in balance, in order not to vibrate and cause shaft-bearing trouble.

Recent Designs of Motors, Controllers and Industrial Lighting Equipment

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By FRANK J. OLIVER
Associate Editor, The Iron Age

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A NEW line of d.c. fan-cooled, explosion-proof motors is being offered, as well as a fractional-horsepower series of universal type. Among the electrical control equipment are two snap action switches, and several developments in protective equipment, from fuses to circuit breakers. Numerous lighting fixture units are illustrated for use in drafting room, shop or mine.

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A COMPLETE new line of d.c. explosion-proof motors has been announced by the *Louis Allis Co.*, of Milwaukee. These motors have been approved by the Underwriters' Laboratories for use in all class 1, group D, explosive atmospheres up to and including frame size No. 774. They are interchangeable with reference to dimension *D* and shaft sizes with standard NEMA a.c. and d.c. motors and therefore have unusually small overall height, making them particularly adaptable for mine service.

The heavy steel field ring is constructed to withstand over five times the greatest internal explosion pressure and is snugly fitted to reinforced end brackets carrying the ball bearing housings. A heavy steel plate cover directs the blast of cooling air over the housing, being propelled by a radial type aluminum alloy fan on the commutator end of the shaft. Air intake is through an aluminum grille. There is also a centrifugal steel plate fan on the other end of the armature for the internal circulation of air for cooling the field ring and windings. Accessibility to the armature and brushes is given by large threaded bronze screw covers, which can be sealed to prevent tampering.

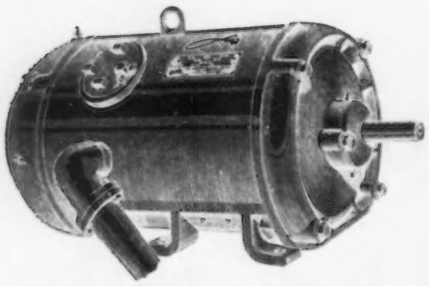
Fractional-Horsepower Motors

HIGH precision, grease sealed ball bearings, mounted in steel sleeves in aluminum housings, with preloading springs to eliminate end play, are featured in the type W and W2 fractional-horsepower motors, recently introduced by the *Dumore Co.*, Racine, Wis. They are of the plain series universal type, operating on either a.c. or d.c., and have varying speed characteristic. The maker recommends them for a variety of high speed applications requiring particularly well balanced armature and dependable service. Line leads are connected to two-pole male connectors mounted in the housings.

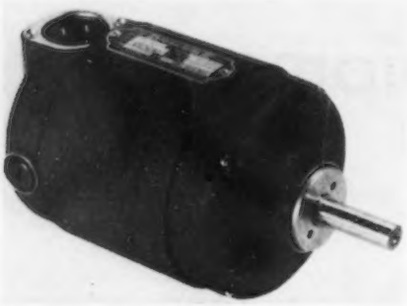
Type W is made in 1/3 and ½-hp. ratings at 6500 r.p.m. full-load speed (15,000 r.p.m. free speed), while type W2 comes in ½ and 2/3-hp. ratings at 8000 r.p.m. full-load speed. Cast iron bases may be had for both types at extra cost. A related series, types WC and W2C, are of identical capacity, but come equipped with ¼-in. capacity chucks. Type WF is another style with flange mounting for direct connection.

Starting Switch

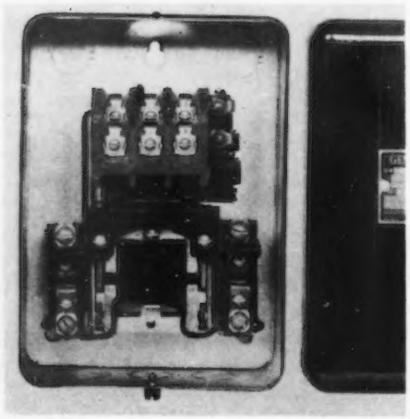
A SMALL and compact a.c. magnetic switch (CR7006-D51) has been developed by *General Electric* for full-voltage starting of single, two and three-phase motors. Basically, it consists of a direct-acting, solenoid operated line contactor, with interlock to provide undervoltage protection, and two isothermic temperature overload relays to protect the motor against overheating. These elements are mounted in a general-purpose sheet steel enclosing case. All the magnetic elements have been redesigned to give low maintenance costs over a long period of time. The contacts are double break and both stationary and



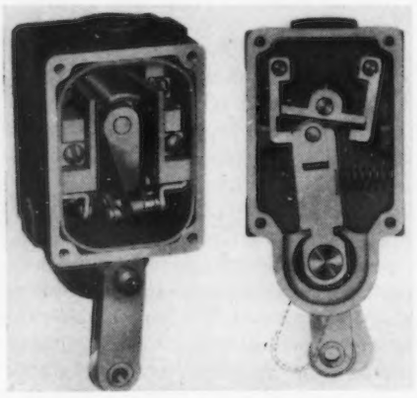
THE type ENA, frame 225, 3-hp., 1750 r.p.m. motor is one of a new series of fan-cooled d.c. explosion-proof motors built by Louis Allis Co., particularly for use in gaseous atmospheres.



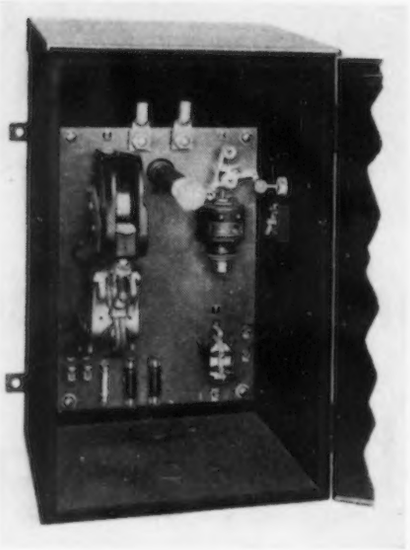
ONE of a new series of type W ball bearing Dumore motors, available in aluminum housings and in ratings from 1/3 to 2/3 hp.



NEW small size G-E magnetic a.c. switch, shown with three-pole construction and general-purpose case.



NATIONAL-ACME Snap-Lock switches are for use on all normal circuits such as apply to machine limit switches, conveyor lines, safety, counting and signal switches. A cast iron barrier separates the mechanical parts, right, from the double-break circuits, left.



FOR the protection of d.c., power circuits, such as sections in coal and ore mines, crane feeders and similar industrial applications, the Electric Controller & Mfg. Co., 2692 East 79th Street, Cleveland, has developed the Line-Arc repeating sectionalizer, shown above. It consists of a magnetic contactor of Line-Arc design, an overload relay equipped with ratchet lockout feature and a timing circuit to provide time delay after the overload relay has tripped and opened the contactor due to overload, ground or short circuit. The ratchet can be adjusted to give from one to six operations before the contactor is definitely locked open, and a push button is provided to reset manually, as well as an on-and-off push button for closing the magnetic contactor. The device is intended to localize the interruption to the section in which the disturbance occurs.

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AT RIGHT

A POWER driven tank lifting device for oil circuit breaker maintenance has recently been developed by Westinghouse Electric & Mfg. Co. A small motor and reduction gearing has been applied to a conventional lifter ordinarily used as a hand operated device. The combination is mounted on wheels for portability. The worm and gear used in the drum drive for the cable is self-locking, so that the device will hold the load in any position. The lifter is shown at right in position for lowering the first tank.

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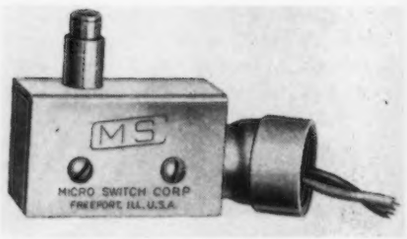
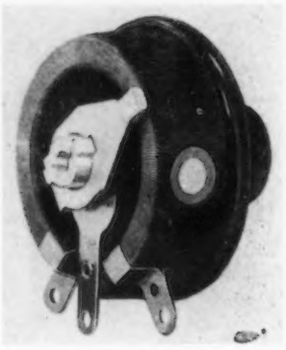
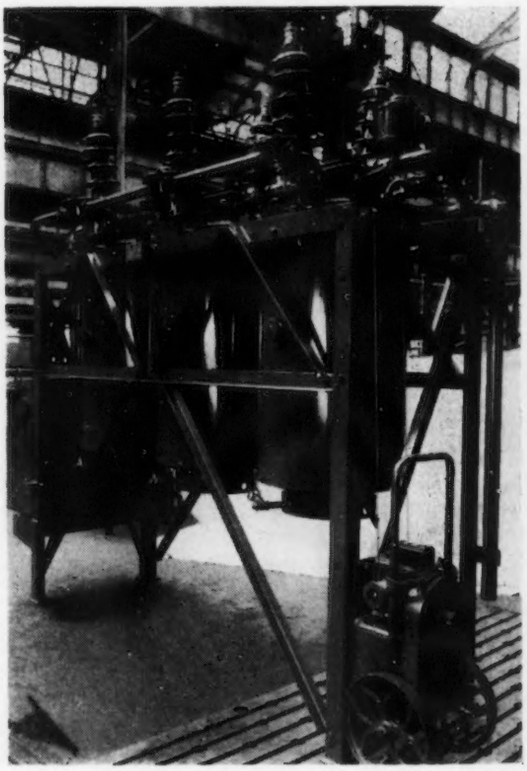


A MOVEMENT differential of a few "tenths" is all that is required to operate this metal clad Micro switch, which incorporates ¼ in. overtravel without injury to the mechanism.



ABOVE

MODEL G 75-watt power rheostat-potentiometer is a new size in the line made by the Ohmite Mfg. Co., 4835 Flournay Street, Chicago. The resistance wire is imbedded in vitreous enamel and the entire shaft and bushing assembly is insulated from the electrical circuit by a ceramic driving hub. Contact is copper graphite.



movable tips are made of silver with a thin steel backing for strength. Saddle type terminal clamps make the switch easy to wire.

A new magnetic switch also has been announced for use with single-phase motors. Available in ratings of 3 hp. at 110 volts, 5 hp. at 220 volts, and 7½ hp. at 440 volts, the device consists of a standard general-purpose four-pole magnetic switch with two poles connected in parallel. This arrangement makes the device equivalent to a two-pole switch with one overload relay. Its application is limited to use with single-phase motors whose normal full-load current does not exceed 30 amp.

Snap-Lock Switch

THE electric circuit mechanism is separated from the mechanical operating mechanism by a partition in the box casting of the new 16D-1200 Snap-Lock switch made by *National Acme Co.*, Cleveland. Thus reasonable oiling of the mechanical parts is permitted without damage to the electrical circuits. There are two double break circuits, either one of which can be normally open with the other normally closed, or by removing the return spring, the contacts may be open in either position. The switch can be made to break a normally closed circuit or to make a normally open circuit.

A light pressure and 10-deg. travel operates the switch, and there is additional overtravel of 29 deg. The operating arm is mounted on a serrated shaft, permitting an adjustment of 80 deg. either way from normal. The standard trip arm is furnished with a hardened steel roller.

Micro Switch

OVERTRAVEL of ¼ in. of the operating plunger beyond the operating point is permissible without straining the snap action of the new series Q metal-clad micro switch, made by *Micro Switch Corp.*, Freeport, Ill. This trigger switch has a pretravel action of 0.015 in., with an operating pressure of 7-8½ oz., and a movement differential of 0.0002 to 0.0003 in. only is required to operate the switch. Contact arrangements can be for normally closed, normally open, or double throw circuits. The cap of the 5/16-in. diameter plunger is hardened and polished, making it possible to use the series Q switch in contact with a high speed actuator, such as is found on automatic machinery.

This actuator switch is sealed in a

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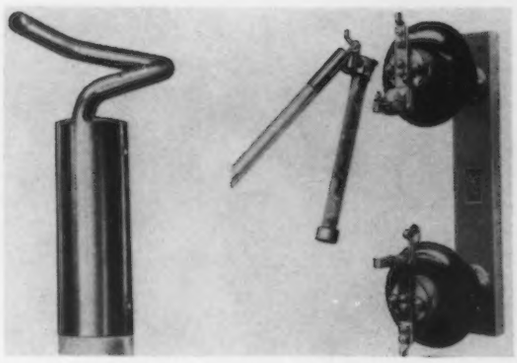
AT RIGHT

IN place of the usual short steel hook extending at right angles to the switch stick, Schweitzer & Conrad, Inc., Chicago, has put a 6-in. length of tempered steel rod bent into a spiral shape for pulling, grasping and carrying. With this type K stick, disconnect switches, cutout tubes and fuses may be opened, removed and replaced without danger of the hook slipping off.



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AT LEFT

ENCLOSED fuses with silver contact surfaces are now being offered by General Electric.

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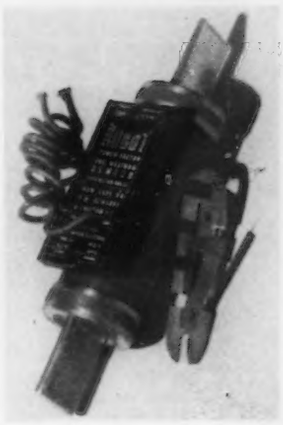
THE renewable element of Robot signal fuses incorporates a thermostatic switch calibrated to give an alarm when a predetermined demand load or minimum power factor are exceeded, besides giving normal overload protection.



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THIS G-E strip-chart recording voltmeter uses a typewriter ribbon as the marking medium, in place of the conventional inking system, thus eliminating the hazards of spillage, evaporation, freezing and clogging of pens. The stylus strikes the ribbon four times per second.

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ABOVE

TWO sizes of DeLuxe laminated bakelite fuse pullers are being offered by Trico Fuse Mfg. Co.

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THE target appears on the scale as a bright line in this new G-E light-beam portable electrostatic voltmeter, shown with the cover removed.

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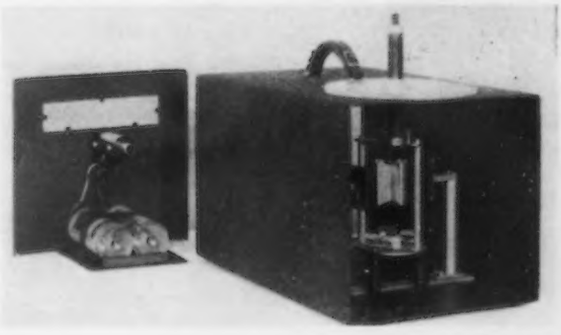
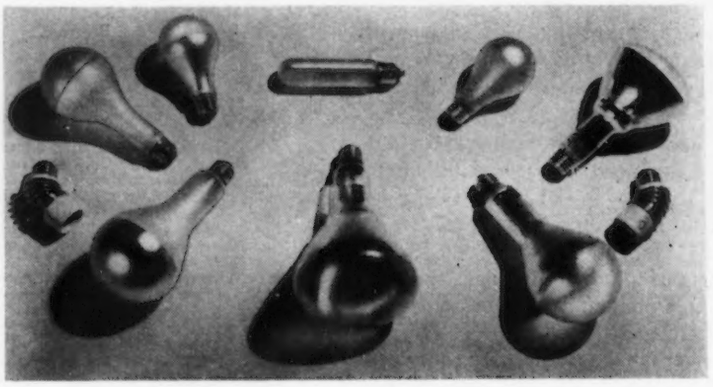
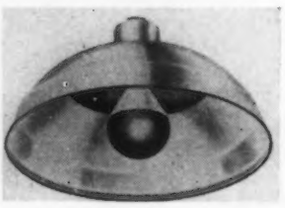


NEW Westinghouse high intensity mercury-vapor lamp, smaller than a lead pencil, but giving more light than 40 100-watt filament lamps. It operates at high pressure and temperature and is intended to be used inside a water jacket. The light source is extremely concentrated.



SOME of the different types of reflector lamps, inside-silvered, now being supplied by the Birdseye Electric Co., 100 East 42nd Street, New York. The swivel sockets shown give full directional flexibility to the lamps.



AN inner aluminum reflector in combination with an enameled reflector is used in the Westinghouse diffuser for silvered bowl lamps.

NEW Benjamin RLM silvered bowl lamp diffuser also combines aluminum and porcelain enamel reflectors to soften the shadows and minimize glare.

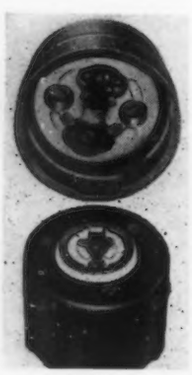
metal housing with right or left-hand angle conduit fitting for ½-in. pipe. It is rated for 10 amp., 125 volts a.c.; or 2 amp., 600 volts a.c.

Fuse Equipment

A NEW line of non-renewable enclosed fuses having contact surfaces of heavily plated silver has been announced by the *General Electric* wiring device section, Bridgeport, Conn. Although these Silvend fuses have been designed primarily for apparatus with silver-plated fuse clips, the new fuses are said to give better results than ordinary fuses even when used with brass or copper fuse clips. The object of the design is to avoid heating due to resistance built up by oxidation on the contact surfaces. These fuses are available in 3 to 600 amp. capacity at 250 volts.

An automatic Robot signal fuse that will sound an alarm bell or actuate a pilot light when a pre-set power demand load is reached is being made by the *Champion Electric Fuse Co.*, 684 Broadway, New York. The same device can also be set to signal when the plant powerfactor reaches a minimum level, and offsetting in the same way overcharges for power. Fundamentally, the device is actuated by a patented thermostatic control switch riveted to the renewable fuse element. The signal alarm may be placed anywhere in the plant, such as in the plant manager's office. To introduce

THIS portable two-way light for maintenance service, made by Carpenter Mfg. Co., Cambridge, Mass., is equipped with a parabolic reflector projecting a 25,000-cp. beam up to ¼ mile. A flood-lighting reflector is provided on the other end, and a two-way switch throws either lighting unit into service. Current is supplied by two No. 6 dry cells. Unit is 10 in. high overall.



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AT LEFT

LOCKLITE hood and reflector neck, showing the new mounting construction available on Westinghouse standard industrial reflectors.

AT RIGHT

ONE of the several styles of Benjamin explosion-proof angle bracket units, this one without reflector.

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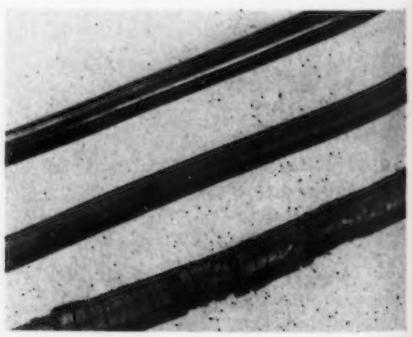
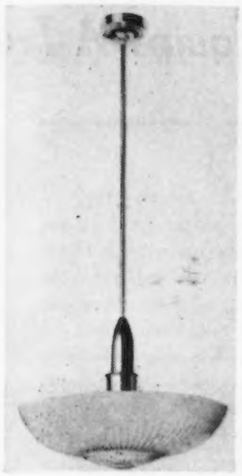
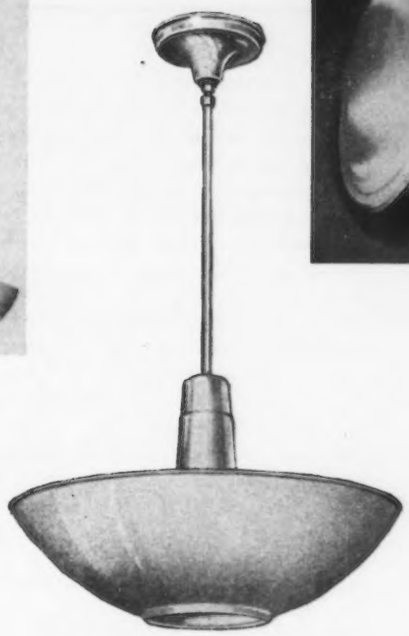


MIDDLE lamp cord shown is a neoprene (du Pont's chloroprene rubber) covered cable after six months' use in the inspection pit of a street railway repair shop. Original cable shown at top. The neoprene resists deterioration in the presence of oil.



ABOVE

WESTINGHOUSE GB-1000 Luminaire for use with incandescent medium Bi-post lamps has a glass basin of Denax glass, giving high reflecting efficiency and low exterior surface brightness.

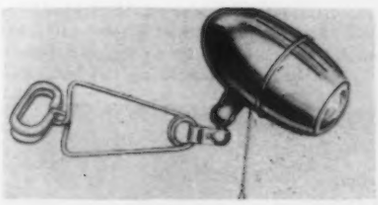


THE Goodrich Argyle indirect lighting fixture for interior use, such as in drafting rooms, has a white porcelain enamel reflector.

ABOVE

THE inside of the bulb of this Westinghouse projector lamp is an accurately made parabolic, silvered reflector, precisely positioned in relation to the filament. Made in spotlight and floodlight forms, for either outdoor or indoor use.

THE Moonbeam spotlight, made by the F. A. Smith Mfg. Co., P. O. Box 509, Rochester, N. Y., has a powerful magnifying lens that steps up the efficiency of an ordinary lighting bulb and confines the beam of soft light within a small area. It is intended for use in spotting precision operations in the machine shop. The adjustable clamp grips up to a thickness of 2 in. and is provided with a thumb screw.



THE Personalite, made by the Brown Electric Co., 69 Morton Street, Rochester, N. Y., is equipped with a strong spring clamp which allows it to be fastened in any location to project a clear, strong light on the work.

the fuse, it is being sold on a three months' rental basis. It comes in 100, 200 and 400-amp. capacities at 250 volts.

The same company also manufactures a fuse with a thermostatic shunt to carry high motor starting loads and yet give ample protection for normal running currents.

A fuse puller made of laminated bakelite, said to be five times stronger than pullers of the solid milled type, is being offered by the *Trico Fuse Mfg. Co.*, 5th Street at Chambers, Milwaukee. All metal parts of this so-called DeLuxe model are cadmium plated. Style No. 123 has five laminations 7½ in. long for fuses up to 200 amp., 250 volts and up to 100 amp., 600 volts. It has a handy screw and cap driver attachment. Style No. 125 has seven laminations 12 in. long for fuses up to 600 amp., 250 volts; of up to 400 amp., 600 volts.

Electrostatic Voltmeter

FOR the measurement of exceptionally high voltages (in conjunction with a voltage divider), the determination of peak voltage by the vacuum tube method, or for the study of electrostatic phenomena such as the generation of charges by moving belts, *General Electric* is supplying a portable electrostatic voltmeter in ratings of 3 to 20 kv. It will measure either a.c. or d.c. voltages on systems where one line is grounded. The combination of a light beam pointer and conveniently distributed scale assures quick and accurate readings. Reading time is about 4 sec. and accuracy is 2 per cent of full-scale value. Inside the terminal is a current limiting resistor that is a safety device if overvoltage is applied.

MUELLER ELECTRIC CO., Cleveland, is now furnishing insulated test clips made from neoprene synthetic rubber.

A JACK knife encased in the handle of a screw driver is the latest combination tool offered by Stanley Tools, New Britain, Conn., for electricians' use. Model No. 1022 has the jack knife permanently mounted in the hardwood handle of the screw driver; model No. 1023 has a release button that allows the jack knife to be withdrawn as a unit from the Stanloid composition handle.

Glass Insulated Magnet Wire

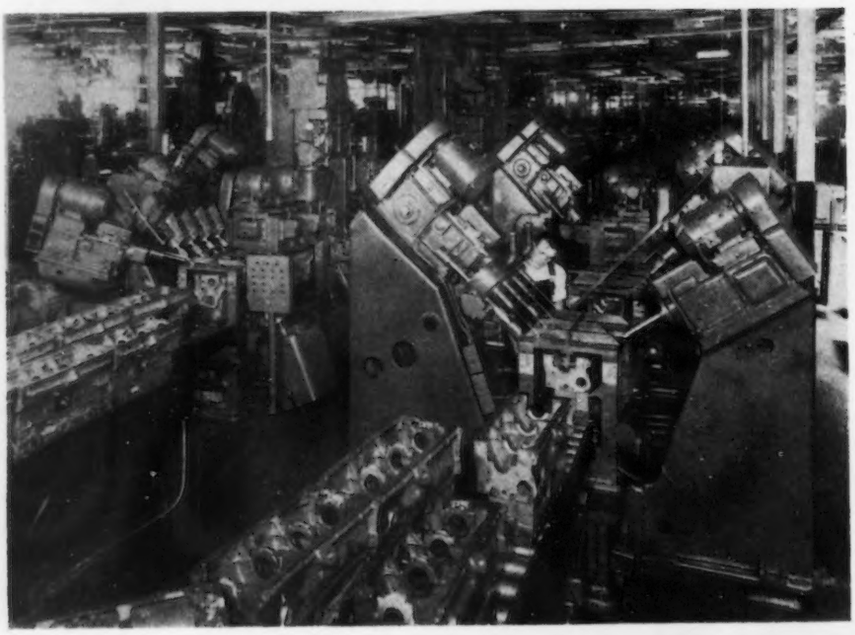
DELTAGLASS designates the new glass fiber insulation used for a new line of magnet wire recently announced by the *General Electric* construction materials division, Bridgeport. The new product is available in round, square, and rectangular shapes. Deltaglass magnet wire, recommended for apparatus windings where the temperature does not ex-

(CONTINUED ON PAGE 64)

International Harvester Equips A Truck En

HEREWITH are illustrated a few of the many machine tools installed in the new truck engine works of the International Harvester Co. at Indianapolis, which was recently put into operation. Laid out in single-story units, with sawtooth roof, the present manufacturing area has 363,000 sq. ft. of floor space and capacity for producing 680 engines daily of two basic types. A total of 8200 lineal feet of roller conveyors for handling material in process between the various machine operations and the assembly line have been installed, as well as six trolley conveyor systems, totaling 8000 ft. Thirty Cleveland tramrail systems, including both the monorail and the crane type have also been installed. Bays are 22 x 33 ft., allowing space for two or three machine lines and the required aisles for moving materials. All parts production lines are laid out at right angles to two main assembly lines and are arranged so that they intersect the subassembly lines at the nearest possible locations to the stations where the particular subassembly joins one of the main assemblies.

CINCINNATI dual ram hydraulic broaching machine for finishing both sides, top of bolt bosses and contact face of cylinder block bearing caps, as well as semi-finishing the bearing shell half hole. The fixtures are universal to accommodate all of the various types of caps, with only minor changes and adjustments necessary. A similar type Colonial broaching machine does corresponding operations on the connecting rod and cap.



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AT LEFT

THESE W. F. & John Barnes three-station drilling and tapping machines are fully automatic types for cylinder block work. Through push button control, the cylinder block is indexed to position, raised and clamped, at which time the spindles quickly approach, feed and automatically return to the starting position. The block is then automatically lowered and indexed horizontally to the next station. The machine movements are completely interlocked so as to prevent tool breakage or damage to the work.

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o o o

AT RIGHT

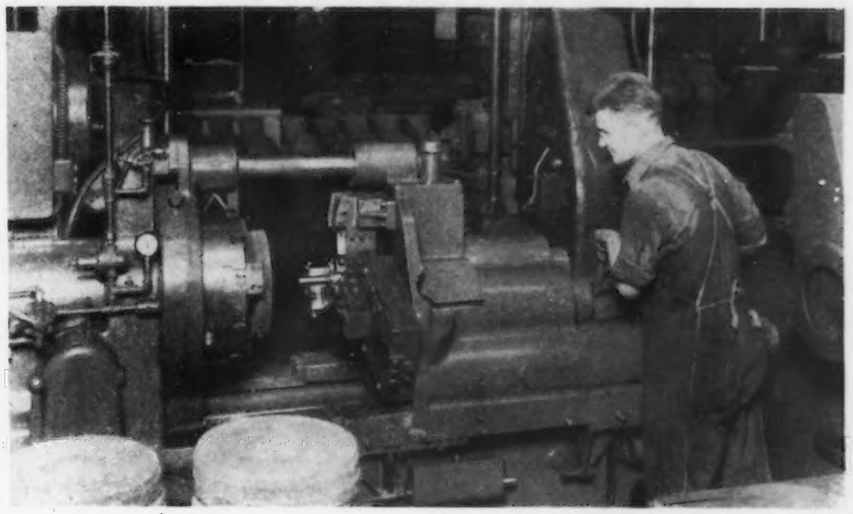
TWO special four-station Ex-Cell-O machines for finish turning the o.d. of pistons, finish facing the piston head and grooving the ring lands. Tool block movements are hydraulically actuated and the pistons are held by air chucks while being machined. The wrist pin holes are later bored on Ex-Cell-O double-end precision boring machines.

o o o

uck Engine Plant at Indianapolis

AT RIGHT

BATTERY of 14 No. 2 Cincinnati universal tool grinders in the central tool maintenance department. Sellers and Oliver drill grinders and drill pointers, B & S tap sharpeners, Barber-Colman hob sharpener, LaPointe broach sharpener and a variety of general purpose grinders have also been installed in this department.



BELOW

ON each forward stroke of this huge Cincinnati single-ram horizontal broaching machine, the top side of one cylinder head and bottom side of another are surface broached. This machine is equipped with a power-operated, four-station indexing fixture, enabling the operator to load two heads at the front while the machine is in operation. At the completion of the forward stroke, the fixture indexes 90 deg., and during the return stroke a hydraulic pusher ejects the heads, one to a transfer cradle to be reloaded to finish the other face. A photo-tube prevents operation of the machine if the piece is misalined in the fixture or if the castings have excess stock.

o o o

ABOVE

ONE of six Gisholt Simplimatic chucking machines tooled for rough turning, facing and boring the flywheel. The multiple tool set-ups on the ram head are radially operated. Chucks are pneumatically actuated.

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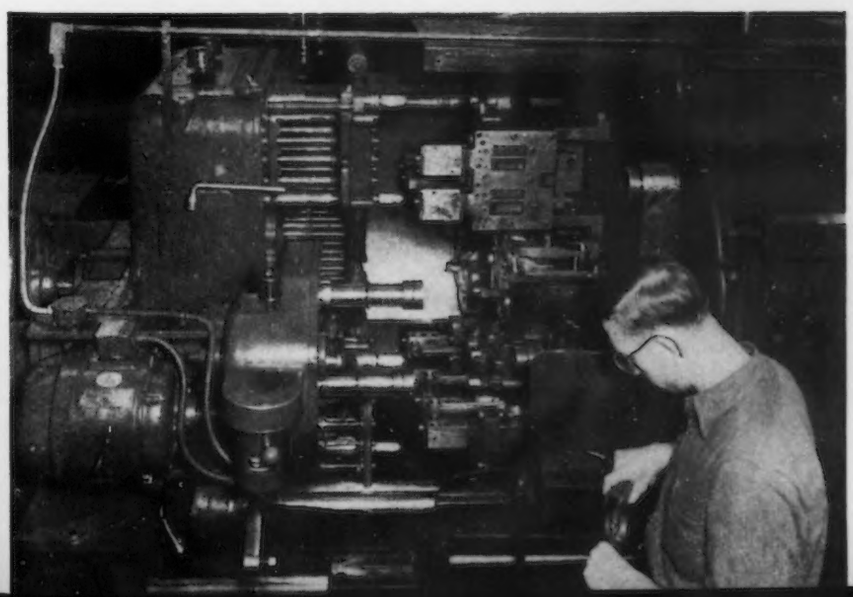

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AT LEFT

A SPECIALLY built Greenlee machine for drilling, reaming, counterboring, and spot-facing the bolt holes in both the connecting rod and cap simultaneously. Rods and caps are held in pairs in the massive indexing fixture, with three work stations and one loading station.

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THIS WEEK ON THE ASSEMBLY LINE

o o o

By W. F. SHERMAN
Detroit Editor

o o o

. . . Edsel Ford predicts 50 per cent increase in Ford production next year . . . UAW to wage campaign for uniform pay in parts industry with Ford support . . . Dodge opens truck plant with capacity of 3500 units a week.

DETROIT — Announcement of Ford cars for 1939, the formal opening of the new Dodge truck plant, and revelation that the automotive parts industry will be subjected to a drive for uniform wage practice are outstanding in the events of the past week.

From Edsel Ford comes the most optimistic business forecast recorded to date in the automobile industry. Not off-guard, or hurriedly, but quite deliberately, Edsel Ford said a week ago at the new Ford test track on the Airport, "Yes, I've stuck my neck out; I predict a 50 per cent increase for the Ford Motor Co., and I'll stand by it."

Industry is Optimistic

The optimism which top executives in the automobile industry are displaying is more spontaneous and genuine than has ever been observed. Plans are being made now for the production of more than three million cars in the next year and every favorable influence is being carefully nursed along in the hope that, if the bubble does not burst, production can be pushed to even greater heights. Parts manufacturers and automobile builders actually are scheduling themselves for something above three million units.

In the words of one official of an automobile company, there is reason to rejoice in the fact that inventories of new cars in dealers' hands are not increasing. Cars are going directly from the assembly line to the purchaser. In fact, deliveries are lagging just a wee bit in many cases. Thus by just keeping pace with demand, the industry assures itself of some work to do (supplying dealers with stock) when buying eases up in mid-winter. Moreover, after that phase has passed, there still will be parts banks to be built high in anticipation of spring production. Schedules are being carefully prepared and obediently followed. The industry is like the parent of an infant prodigy, anxious for progress, but unwilling to urge the prodigy too far. The industry wants to provide enough steady work this winter so the auto workers themselves can buy cars. They are good customers; a look at auto factory parking lots shows that The Rouge plant alone provides space for 25,000 workers' cars, many of them new ones.

Labor Outlook Better

Of course, there is always the labor situation to wonder about, but the Martin-Bennett-Ford combination is being counted on increasingly to cure some of those ills. Homer Martin, president of the UAW, has just announced that in all further labor contracts with companies supplying parts to the automobile plants, the United Auto Workers will seek to standardize wages, hours of employment and working conditions. It was intimated that the plan was connected with Martin's recent visit with Harry Bennett Ford Motor Co. personnel director.

On this point, Bennett told a newspaperman:

"We are willing to go along with any plan for stabilizing wage rates where it is any of our business."

He said that the company's purchasing department had been instructed not to favor parts suppliers with low wage rates at the expense of competitors with higher wage scales and better working conditions. While he declined to be more specific, he indicated that the Ford company intends to help remove the advantage now held by certain unorganized parts suppliers over those with union agreements.

It is estimated that there are 2000 supply plants directly connected with the industry. Some of them supply Ford exclusively; all of them would gladly take Ford business if they could get it.

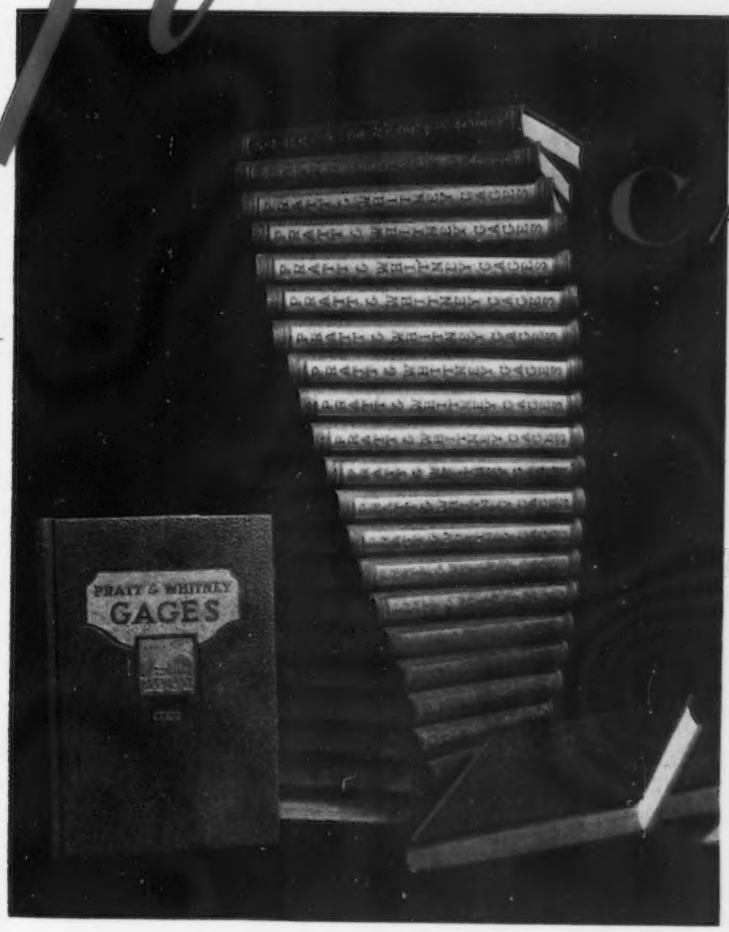
Meanwhile a postponed meeting of the UAW executive board was scheduled to convene on Wednesday of this week to consider, among other things, a program for organizing Ford workers.

Dodge Truck Plant Opened

K. T. Keller, president of Chrysler Corp., had a big day last week. Turning his interest to the Dodge division, where he was the prime mover for years, he presided at the opening ceremonies for the new truck plant, and later officially ushered the first new 1939 truck off the assembly line.

To address the press, he mounted a desk so everyone in the crowded room could see him. He described the new building as "an upside-down" factory which displays a new concept of daylight illumination and ease of installing conveyors and other equipment. "Monitors, instead of sticking up above the roof, are suspended on cantilevers," Mr. Keller said, "and the

New Pratt & Whitney GAGE CATALOG No 10



THIS NEW BOOK—just off the press—contains the newest up-to-the-minute information on precision gaging and measuring. It is much more than a catalog. Included are data on modern gaging methods—working gages designed for use right at the machine—inspection gages for selective assembly—master gages—A.A.R. gages—A.P.I. gages—and many more. This book is free to any interested executive who will request it on his company letterhead.

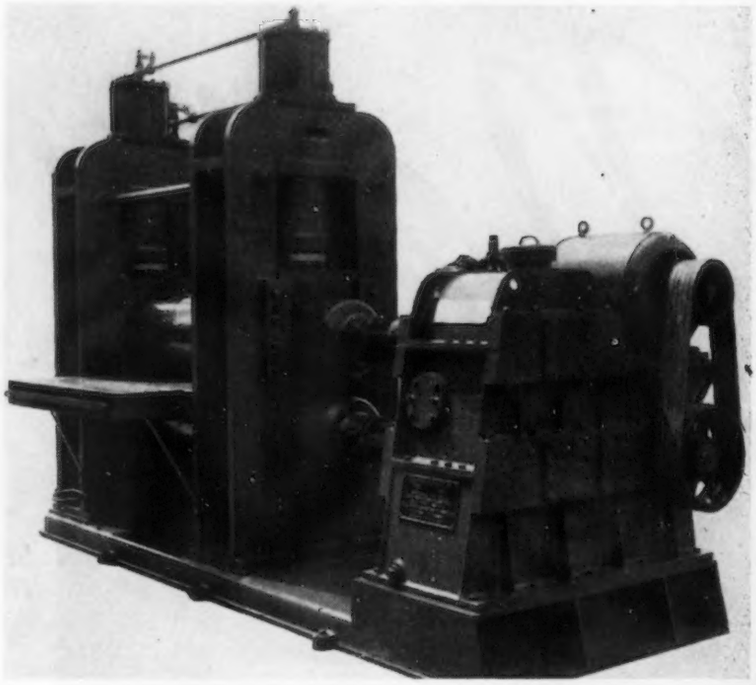
If you manufacture... your name should be here

Pratt & Whitney
DIVISION NILES-BEMENT-POND CO.
HARTFORD • • • CONNECTICUT

result is plenty of light and an easy job hanging overhead equipment." The plant, as designed by the internationally known architect, Albert Kahn, represents the most recent development in this type of structure. It will have a peak capacity of 700 trucks a day, ranging from the half-ton commercial units, powered by Plymouth engines, to the huge diesel and gasoline highway units. Located far from the industrial areas built up inside Detroit, the plant organization is self-contained with its own management, planning division, resident engineers and employment office and hospital.

Output At New 1938 High

During this eventful week, automobile output continued its climb for the sixth consecutive weekly period and reached a new high level for 1938. A year ago production was on the decline. Output for the past week was estimated at 73,335 cars and trucks, compared with 68,360 the previous week and 90,155 a year ago, according to Ward's Automotive Reports. Ford showed only a slight increase to 12,875 Fords, Mercurys and Zephyrs. Chevrolet and Plymouth both registered slight increases, the General Motors unit jumping 1000 to 21,000, while Plymouth increased 900 to 10,900.



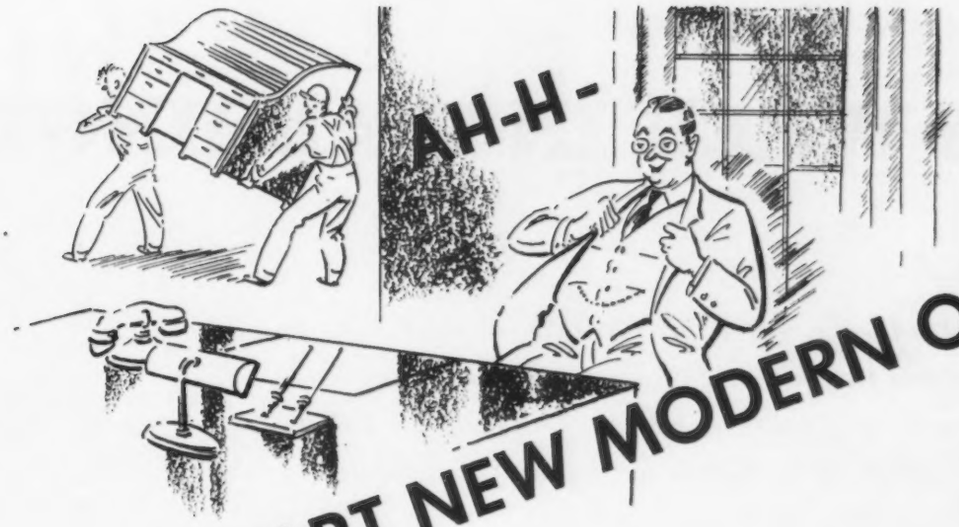
New Machine Used for Re-rolling Auto Scrap

RE-ROLLING of auto body trim stock, described in THE IRON AGE Assembly Line of Oct. 20, is being done with equipment designed by Dorr-Patterson Engineering Co., Detroit. The press has two 18-in. by 50-in. rolls driven by a 25-hp. electric motor with a magnetic clutch coupled to a multiple-belt drive and gear reducer. The rolling mill type, brass-lined gear boxes are so machined that the rolls do not touch. The rolls have a surface speed of about 120 ft. per min. No attempt is made to reduce the thickness of the scrap to a uniform value, but it has been found that the results are consistent enough to permit the use of processed scrap in nearly 190 small parts for automobile bodies.

Hydro-pneumatic pressure permits a wide range of pressure on the rolls up to a maximum pressure of 200 tons. The pneumatic cylinders "ride on the line" and do not consume any compressed air. Bearing boxes are alemite equipped. Cylinder packings can be applied without dismantling the press and the assembly of rolls and boxes can be removed through the end housing. The upright base and feed tables are of welded steel. A safety bar on the work side cuts off the motor and energizes the brake when the bar is forced in.

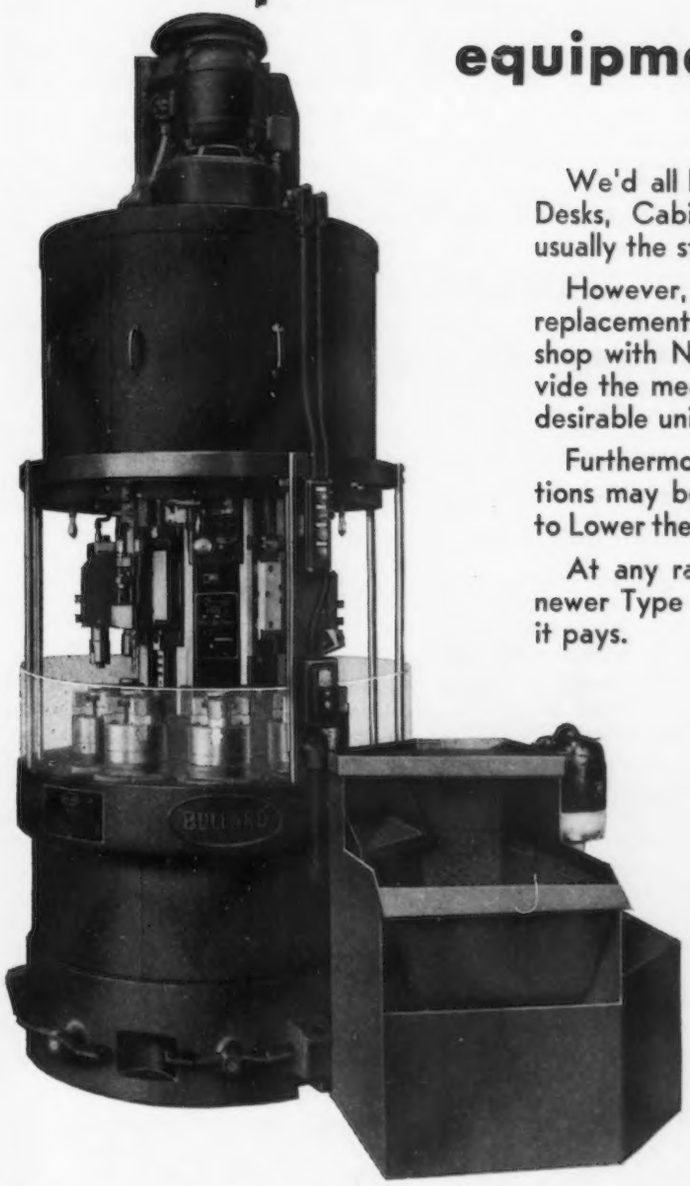
THE BULL OF THE WOODS — BY J. R. WILLIAMS

THEM'S DICKS. I HEARD 'EM TELL TH' BULL THAT TH' GUY ON THAT LATHE KICKED A KITTEN TEN YEARS AGO.... THEY'RE TAKIN' FINGERPRINTS -- THEY THINK THEY FINALLY GOT THEIR MAN BUT ARE MAKIN' SURE
AFTER TEN YEARS THEYRE PUTTIN' HIM IN TH' HOOSEGOW TO CURE HIM OF KICKIN' KITTENS ?
WHY, HE'S CURED HISSELF! HE AIN'T KICKED A KITTEN FER TEN YEARS!
THATS TH' LAW, THOUGH -YOU AIN'T CURED TILL THEY CURE YOU -- AN' THEY BRING BACK TH' THINGS YOU'VE FORGOT, AN' YOU GO TO KICKIN' KITTENS AGAIN!
T. M. REG. U. S. PAT. OFF. COPR. 1938 BY NEA SERVICE, INC.
THE TOMB DISTURBERS
J.R. WILLIAMS 10-28



A SMART NEW MODERN OFFICE !

BUT..how about the equipment in the shop ?



We'd all like that Smart New Modern office; Metal Desks, Cabinets and what-have-you! BUT! That is usually the stumble word.

However, the Lower Costs and Profits resulting from replacement of the old manufacturing equipment in the shop with New Smart Modern machine tools will provide the means for the purchase of other needed and desirable units in your organization.

Furthermore Savings from Mult-Au-Matic installations may be distributed as additional Profits or used to Lower the Price of your Products or maybe both.

At any rate, many manufacturers replace with the newer Type "J-7" Mult-Au-Matics because they know it pays.

If it Profits others to use Mult-Au-Matics it can and will Profit you to do likewise.

Send us job prints or samples for time studies and Estimates. Then compare with the best previous method.

THE BULLARD COMPANY

BRIDGEPORT · CONNECTICUT

THIS WEEK IN WASHINGTON

. . . New Deal uncertain as to its attitude on steel prices with CIO's efforts to protect wages by keeping prices up, confusing attacks on basing points . . . Only one of 2300 associations refuse aid in Monopoly Inquiry . . . Utilities to spend $1,000,000,000 yearly.

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By L. W. MOFFETT
Resident Washington Editor
The Iron Age

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WASHINGTON. — The New Deal appears to be perplexed regarding the attitude it should take toward the steel industry. It has been the practice of Administration sources to attack the industry for so-called high and rigid prices. Charges have been made that there was no competition. The basing point system has been assailed as being chiefly responsible for the conditions which drew the fire of criticism and one device after another was attempted to break up the system. Whether the industry was in the red or in the black, it was made the object of blasts of condemnation.

Then in June of the present year a sweeping change was made by the steel industry in its pricing policy. This change was more significant than the simultaneous and substantial price reductions which were made. For under the new policy price differentials over the Pittsburgh base were either entirely wiped out or greatly reduced. The effect was to put other producing points on a parity with or only slightly over Pittsburgh. Thus, while the much attacked delivered price system was not abolished, the result was to greatly modify the system and to make an important approach in effect to an f.o.b. mill system of quotation.

New Dealers hailed the price reductions joyously and even had kind words for the steel industry. As to the change made in the pricing policy, nothing was said. Perhaps its significance was not grasped or it was considered unimportant. In the industry there was a different attitude. The announced reduced prices were accepted as a reflection of weakness that had been prevailing and made official levels which previously had been forced down in a scramble for business but not openly quoted.

Whether because of the announced lower prices or of improvement that already was under way there was a pick-up in steel orders. But there remained much idle capacity and competition continued to be sharp. Prices again were reduced. Quotations on flat rolled products were slashed $6 a ton.

The industry became demoralized. The Steel Workers Organizing Committee, which opposed price reductions, fearing the effect on wages, affected great alarm. So concerned did SWOC become, that its president, Philip Murray, made the calamitous threat that unless the industry puts its own house in order organized labor would take over the job. He implied that demand for Government control of the steel industry would be made. The intimation was that a commission to run the steel industry would be set up along the line of the National Bituminous Coal Commission. Considering the lamentable record of the Coal Commission it would be difficult to imagine a worse disaster for the steel industry.

Differs With CIO

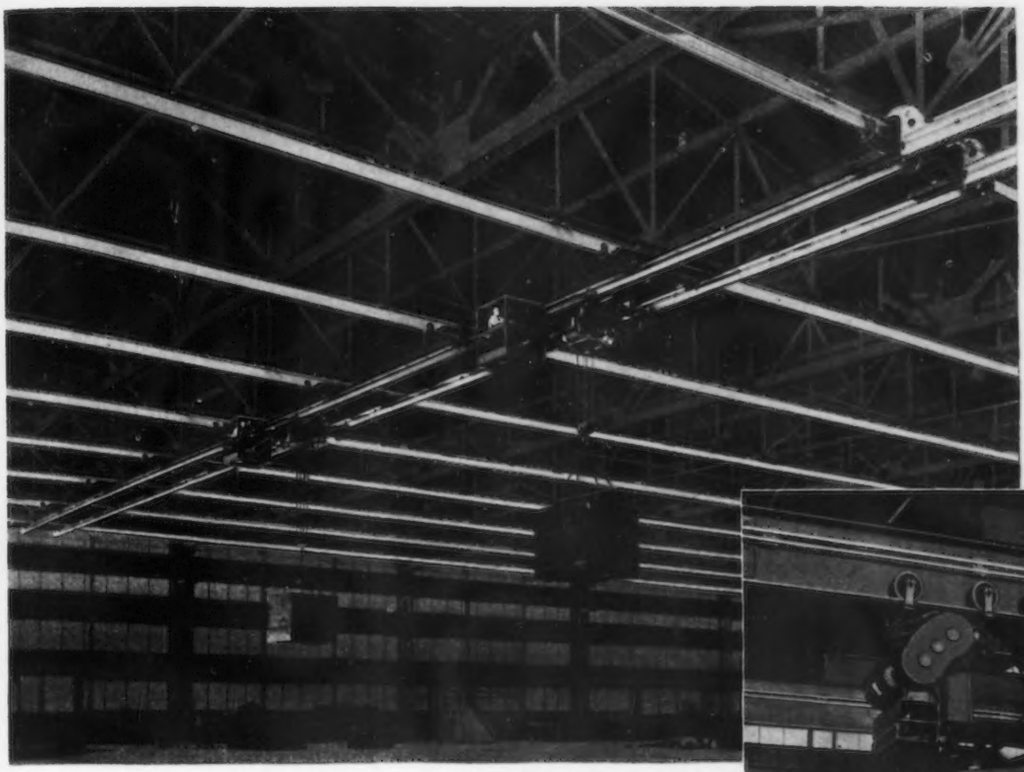
Close associate of the CIO that it is, the New Deal differed with it on the steel price policy. The New Deal wanted prices cut. But when the second slash was made, some Administration officials also affected concern and did some pre-election wailing over the condition of the steel industry, which was sinking more deeply in the red. It is suspected, however, that a great deal of this apprehension was due to a feeling that wage cuts might be forced on the industry, the Public Contracts Board findings notwithstanding.

But since the $6 price reduction has been withdrawn there seems to be another Administration shift. Apparently there is a concern now that prices may get too high, which, it is insisted, will choke off orders which have started to rise again. This view is shared in the face of the fact that a wide section of the industry still is not making profits. As has been pointed out by THE IRON AGE, the breakeven point has been considerably lifted by the combination of lower prices, high wages and the elimination of basing point differentials. To this combination might well have been added the matter of high and constantly increasing taxes. It is, however, an item that is coolly disregarded by Administration sources whenever they have an outburst against so-called high steel prices.

Administration Uncertain

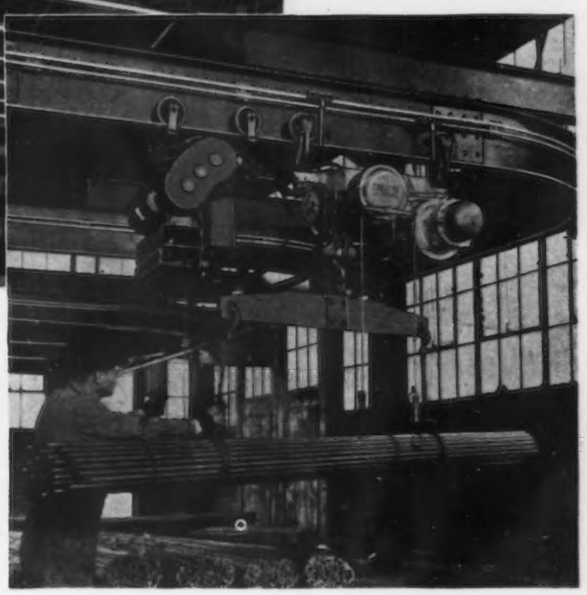
Administration sources have so far made no outcry in opposition to the restored prices, but have implied opposition to a rise in steel prices for the first quarter which some producers maintain will be necessary if there is no wage relief and eliminated price differentials are continued. However, the Administration may go slowly about opposing steel price increases in view of the CIO position which apparently would encourage price rises if it thought they were essential to holding up prevailing wage levels. The setup leaves Administration spokesmen in an uncertain state of mind.

Secretary of Commerce Roper at a press conference last week, speaking specifically of steel prices, but having



160 ft. crane bridge operates from a single drive motor along nine 300 ft. runways. It can be controlled from either 5-ton carrier unit shown.

3-ton floor controlled carrier with MonoTractor drive permits quick and easy handling of heavy loads over a compact RailMaster track system.



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To meet demands for heavier capacities, American MonoRail engineers developed a complete line of overhead handling equipment including track accessories and cranes for both manual and power operation.

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Full development of the MonoTractor, a pneumatic tire drive unit, makes power operation of carriers and cranes in all capacities, not only simple but reasonable in cost.

A 256 page catalog illustrating the above and all standard American MonoRail equipment, will soon be available. Reservations on company letterheads will be accepted for initial copies.

THE AMERICAN MONORAIL CO

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in mind prices generally, warned against "hiking prices beyond the reach of willing buyers."

At some length, he figuratively patted the steel industry on the back for its price concessions, evidently unaware of withdrawal of the $6 reduction on sheets and strips. He said the concession "brought gratifying results in production, the automobile industry being the principal factor of support."

The Secretary went on to speak of the encouraging outlook in the construction field, through PWA and private expenditures, which, he said, point to further acceleration of steel production, in contrast to recent sluggish activity. He urged the necessity of maintaining prices within the reach of buyers.

At this point an assistant informed the Secretary that recent steel price reductions had been withdrawn.

"That is correct, gentlemen," the Secretary brightly and quickly announced to the correspondents.

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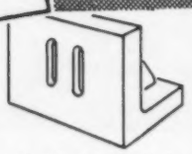
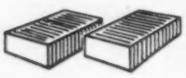
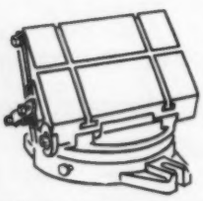


Slotted Angle Irons

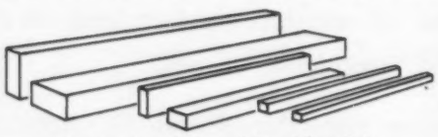


Magnetic V-Blocks & Parallels



Adjustable Angle Plate

Universal Right Angle Irons



Hardened and Ground Steel Parallels

Foremen find that these *standardized* specialties save time . . . and widen the range of machine application (a point of prime importance to tool shops and small manufacturers).

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The

TAFT-PEIRCE MANUFACTURING CO.

Woonsocket, R. I.

A COMPLETE LINE OF SMALL TOOLS & GAGES

T P

NLRB Rules against Cincinnati Union

WASHINGTON. — The Cincinnati Milling Machine Co. has been ordered by the National Labor Relations Board to disband the Employees' Service Committee as a bargaining agency and to reinstate one employee allegedly discharged for union activity. The company claimed that the employee, a coremaker, had been discharged for insubordination and for poor work.

The NLRB charged in its findings that all expenses incidental to the operation of the employee representation plan, which it said was in operation from 1920 up through the public hearings on the case last December, were borne by the company. The findings also alleged that the company had engaged in espionage through the National Metal Trades Association operatives in a purported attempt to curb union activity including membership solicitation.

All the charges had been pressed by the CIO, which also had complained of the discharge of another employee allegedly because of union activity. The board, however, dismissed these latter charges.

U. S. Denies Rumor On Diesel Ships

WASHINGTON. — Vice-Chairman Thomas M. Woodward of the Maritime Commission has issued a statement denying rumors which he said are being circulated to the effect that the commission does not want diesel motor propulsion machinery included in the bids on C-3 combination passenger and cargo ships to be opened Nov. 10. Mr. Woodward charged that the rumors are designed, "apparently to selfish reasons, to discourage submission of bids by those interested in diesel motor propulsion." Attention was called to the bids which call for specifications designated "United States Maritime Commission—Design-C-3—Diesel Propulsion."

Vanadium Corp. Employees To Vote in NLRB Election

WASHINGTON. — The NLRB has scheduled an election some time before Nov. 12 at the Niagara Falls plant of the Vanadium Corp., to permit workers to vote either for or against the CIO's Gas and By-Product Coke and Chemical Workers Union, a division of the United Mine Workers Union.

Utilities Will Speed Building For National Defense Needs

WASHINGTON. — Further steps under the Government's industrial mobilization plan, contemplating capital expenditures of $1,000,000,000 a year for the next two years for the manufacture and installation of generating equipment of about 1,300,000,000 hp. capacity, have been approved by the National Defense Power Committee, of which Assistant Secretary of War Johnson is chairman.

After meeting in a morning conference on Friday with members of the committee, other key Government officials, and 17 utility executives, many of whom have been at odds with the Administration during the past five years, Secretary Johnson announced receipt of definite commitments from leading utility companies in strategic war material centers to place immediate orders for turbo-generators, boilers and auxiliary equipment totaling 1,000,000 kw. of generating capacity.

Wilkie Gives Estimate

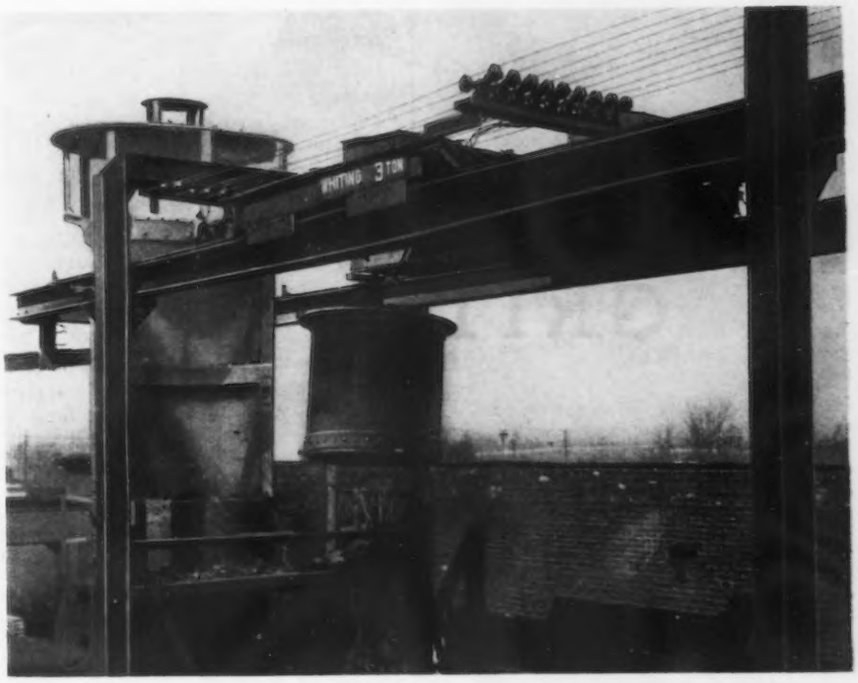
Wendell L. Wilkie, board chairman of the Commonwealth & Southern Corp. estimated to THE IRON AGE that the necessary generating equipment would involve an immediate expenditure of close to $250,000,000 with extras. The areas to be directly affected by the construction program are, for the most part, those producing the bulk of munitions and other war materials. The committee specifically listed, as examples: Baltimore-Washington; Birmingham, Boston, Bridgeport, Buffalo-Niagara Falls, Chicago, Cincinnati, Cleveland, Detroit, New York, Philadelphia, Pittsburgh, Rochester, St. Louis and Schenectady.

The committee, created by President Roosevelt early in September to study existing electric power facilities from the national defense angle, is also arranging for conferences with representatives of the electrical equipment manufacturers in a move aimed at standardization of equipment to expedite its production, reduce costs and curb run-away prices of boilers, turbines, generators and related equipment.

National Defense Studied

While describing the action to be taken immediately as only a part of the program, the chairman characterized it as "a very substantial" first step in a major picture. It is understood that the committee has some 40 engineers checking all angles of the industrial power situation as it relates to national defense, and that since the manufacture and installation of equipment requires considerable time and should be put under way at once, further details as to later connections in hooking up the power net-work can be worked out as time goes on. It was explained as a general thing that the objective will be to assure ample power resources as near as possible to munition manufacturing areas.

While the program is primarily one in the interest of national defense, the utility companies participating ex-



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In most foundries today, charging costs can be cut in half, or better, by installing a Whiting mechanical system. Machine charging, properly applied, not only reduces cost of labor but makes for improved working conditions, closer control and faster, safer, better operation. A thorough study of your individual problem will be made without obligation. ***Send for Foundry Book No. 226.***

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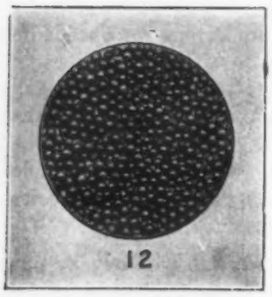
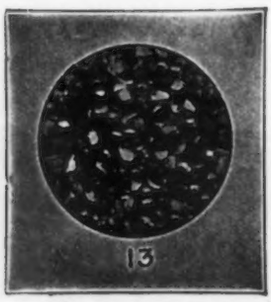


SHOT



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One contract calls for 300 tons of our steel grit; another contract calls for 250 tons of our Special Heat-Treated Shot. Many carload lots of both shot and grit.

There must be a reason for this, and the reason is plain: namely, unusual quality; prompt deliveries; uniform quality the year round; satisfactory prices.

Send samples of the sizes you are now using. We will match any size, and name prices that will interest you.

We manufacture a shot and grit that you will eventually use.

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press the hope that the expansion will also be justified by increased use of electric power. Basing their estimates on the electric power output, which increased 30 per cent, from 1930 to 1937, the utility companies expect the program to be warranted apart from the defense angle.

Government Will Help

As explained by Floyd L. Carlisle, of the Consolidated Edison Co., New York, who discussed the program with newsmen at the close of the conference, new private plants built under the program to replace older and less efficient ones, will be operated by the companies as though built solely for their own purposes. The program is being undertaken by the industry, he explained, with the Government laying down certain requirements in return for which money will be forthcoming in the form of loans or through the sale of securities.

In this connection, such Government agencies as the Reconstruction Finance Corporation, the Securities Exchange Commission, and the Federal Power Commission, are cooperating but it was emphasized that the industry proposes to do as much of the financing as possible through equities and stock sales with the particular method of financing differing as between companies. The extent of public financing will, of course, depend to a large degree upon the security market. Further details as to Government participation in financing part of the program remain to be worked out.

Mr. Carlisle waved aside a suggestion that the program marked the beginning of an era of good feeling between the utilities and the Administration.

"We were delighted to make these studies with the Government," he declared. "They have been most cordial and cooperative. There has been no evidence of any difficulties arising. The whole program seems a very practical way to approach the problem."

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One of 2300 Associations Refuses Monopoly Request

WASHINGTON. — Commerce Department representatives on the Temporary National Economic (anti-monopoly) Committee report that the 2300 questionnaires sent to trade associations throughout the country were well received and that only one association has expressed definite unwillingness to cooperate. The identity of that association was not disclosed.

Approximately 100 active associations had sent in completed questionnaires to the department as of Oct. 26, although the Government representatives do not expect the bulk of returns to be in until Nov. 15. The questionnaires, consisting of some 34 major questions and a substantial number of sub-questions, were sent out on Sept. 26 by the Bureau of Foreign and Domestic Commerce to provide part of the information as the basis for a report to the anti-monopoly committee.

Calling for such specific information as copies of constitutions, by-laws, publications, annual reports, the questionnaire was arranged after consultations with other interested Government departments and trade association officials.

First Thorough Study

Richard C. Patterson, Jr., Assistant Secretary of Commerce and a member of the anti-monopoly committee, said the trade association survey marks the first time association activities will have been studied so thoroughly.

"The explanation of the very satisfactory cooperative attitude toward the Department of Commerce in this survey lies partly in the realization by association executives that a detailed impartial study of all national and interstate associations will clarify many conflicting issues and should result in greater understanding by the general public of the trade association movement," Patterson said. "Association men also realize it will furnish them with much helpful information on the vast scope of associational activities."

Commerce Department officials made

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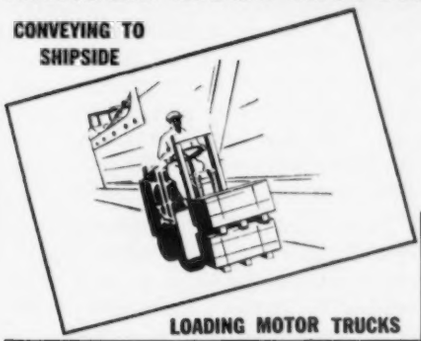

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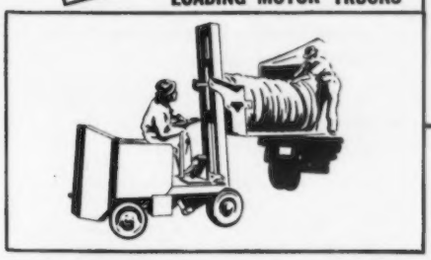
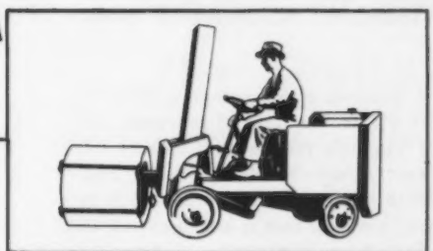
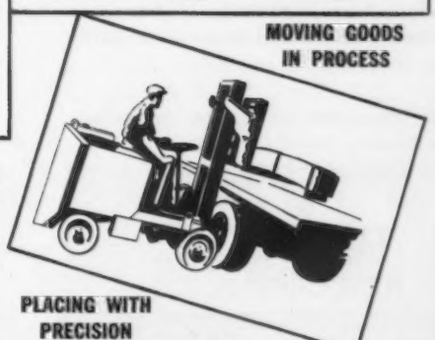




MOVING GOODS IN PROCESS



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no attempt to include state and purely local trade associations in the survey except as such organizations have an interstate or national influence.

Aluminum Products Up 59.2% During 1937

WASHINGTON.—The value of aluminum products manufactured in 1937 was $165,643,275, exceeding the value for 1935, $104,067,370, by 59.2 per cent, according to the Bureau of the Census.

U. S. Steel Seeks to Sell Real Estate Valued at $60,000,000

PITTSBURGH.—Faced with the gigantic task of disposing of properties no longer needed and valued at close to $60,000,000, U. S. Steel Corp. subsidiaries two years ago embarked on a nation-wide industrial real estate selling campaign, believed to be the largest of its kind ever attempted.

Enlisting the aid of industrial real estate brokers throughout the country, the subsidiary companies at the same time made available to prospective customers complete plans, details, and industrial data covering the hundreds of sites put up for sale.

After two years of intensive and painstaking work, the novel experiment is believed to have proved its worth and land valued at close to $8,000,000 has been sold.

Heavy and increasing taxes, relocation of plants, changes in operating and selling policies, unused portions of land bought but not needed in light of later events, and the working out of mining properties, are a few of the more important factors which lead to the decision to make wholesale disposals as quickly as possible.

Property "Priced to Sell"

The excess properties run from small town sites to industrial tracts involving thousands of acres. Major slogan used in the selling drive has been "Priced to Sell."

Prospective buyers of industrial properties have been circularized by U. S. Steel and brokers connected with the program, even to the extent of presenting minute detail and airplane views of properties involved. In practically all cases, railroad facilities are available and in many instances mill buildings constitute part of the "parcels." A fair share of water front tracts is also included in the catalogued properties.

In the promotion literature are included such items as labor supply, transportation facilities, location with respect to markets, particular industrial development in the surrounding properties, and a description of possible uses for the land.

The properties involved in this undertaking are located in or near the following points:

Eastern Area—Boston; Jersey City, Kearny, Newark, N. J.; Essex Co., N. Y. (Crown Point).

Pittsburgh District—Allegheny County, Duncansville, Erie County, Fayette County, Greenville, Johnstown, Leechburg, McKeesport, New Castle, Oil City, Pittsburgh, Sharon, Westmoreland County, (Scotsdale), all in Pennsylvania.

Cleveland District — Cleveland, Conneaut, Peninsula, Ohio.

Youngstown District—Bellaire, Steubenville, Wellsville, and Youngstown, all in Ohio.

Chicago District—Chicago, Ill.; East

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Western Area—Los Angeles, Cal.; Portland, Ore.

Southern Area — Birmingham, Ala.; Fort Worth, Tex.; Mobile, Ala.; Oklahoma Properties; Shreveport, La.; South Pittsburg, Tenn.

Central Area—Bettendorf, Iowa; Dayton, Ohio; Detroit; East St. Louis, Ill.; Kansas City, Kan.; Richmond, Ind.; St. Louis, Mo.; St. Paul, Minn.

Great Britain's Largest Steel Plant Starting

LONDON (*By Mail*).—The great £11,000,000 ($55,000,000) steel and tin plate plant of Richard Thomas & Co. at Ebbw Vale is gradually coming into operation. Various units have been brought into trial usage since the beginning of this month and so far each is reported to have given satisfaction. The battery of coke ovens has been started up and several blast furnaces are in operation, as also are two or three open hearth steel furnaces.

Steel strip is being rolled at the hot strip mill and is claimed to be coming well up to expectations. Late in October and early in November the finishing units will be tested. It is anticipated that the whole of the plant will be producing steel sheet and tin plate on a commercial scale by the middle of December.

More Rearmament Work for British Steel Trade

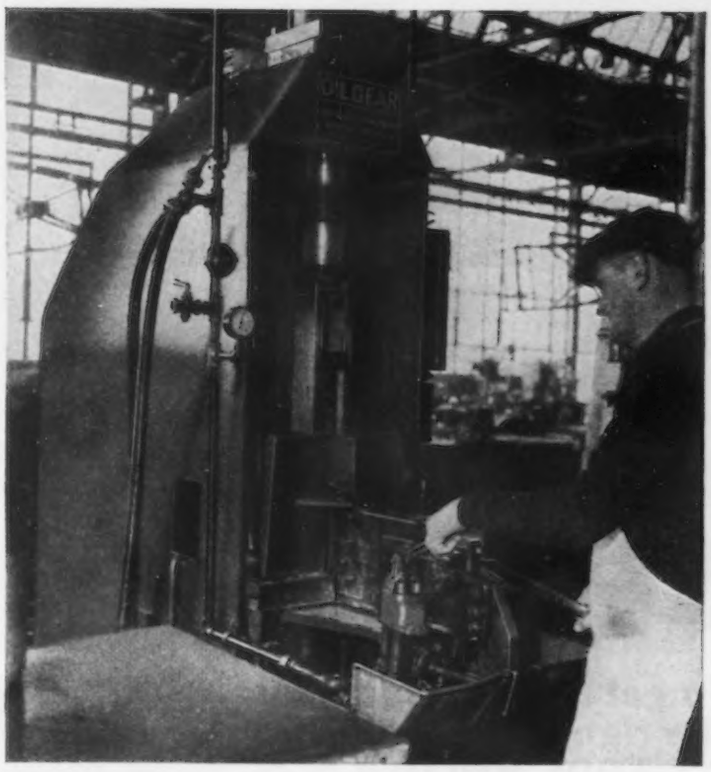
LONDON (*By Mail*).—The recent war scare has resulted in a notable acceleration of the British rearmament program and as a result iron and steel manufacturers expect an early expansion of rearmament orders. They are now in a position to undertake much of this work without interfering with the execution of normal commercial orders.

Already structural departments of the big steel concerns are handling a number of important contracts recently placed for steel work connected with additions to the defense program.

High Grade Ore Deposit Found in the Transvaal

LONDON (*By Mail*).—Details of the remarkable new iron ore field discovered near Walmaransstad, Transvaal, have been received from Cape Town, where a deputation recently made a request that the South African Government should provide railroad facilities for the transport of the ore.

The discovery, as described by W. E. Bleloch, chairman of the South Van Ryn Reef Gold Mining Co., and a member of the deputation, is as follows: The field was discovered by the South Van Ryn company about seven miles from Walmaransstad during gold prospecting operations. The iron outcrops over about 10 miles and goes to unknown depths at present estimated at about 1000 ft. It has been proved down to 50 ft., on which basis alone there is an estimated ore body of 15,000,000 tons of hematite. If anticipations are realized, the deposit ranks as one of the largest in the world. The ore averages 63.5 per cent iron and is remarkable for its low sulphur content (0.003 per cent) and silica (0.3 per cent), and the virtual absence of phosphorus. Ore of this quality is scarce and in great demand for the manufacture of acid pig iron.



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There is room in American Industry for all grades of equipment. But production men who are affiliated with the *leaders*, think only on one level—quality production demands quality equipment.

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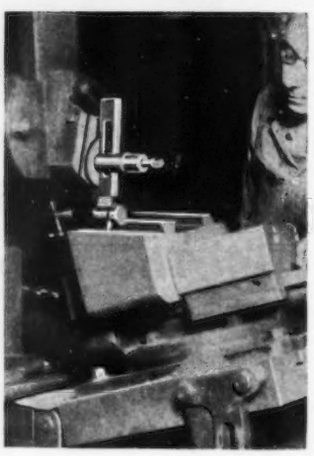

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It is the only way to know that you are getting all the profit to be had on every operation.

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Recent Designs of Motors, Controllers and Lighting Equipment

(CONTINUED FROM PAGE 49)

ceed 125 deg. C., is wound with a glass yarn to which a special Glyptal varnish is applied. Following this another layer of glass yarn is wound on. The varnish permeates both layers, seals the glass and furnishes a smooth, moisture and abrasion resistant surface. The small diameter of the glass fibers used, and the flowing qualities of the varnish, make Deltaglass insulation thinner, thereby improving the space factor.

Industrial Lighting Equipment

A CONCENTRATED source of high intensity light in the form of mercury vapor in a small capillary tube of quartz, operating at a very high pressure and water cooled, has been developed by *Westinghouse Electric & Mfg. Co.* after the initial research work had been done by the Philips Glow Lamp Works in Holland. The 1000-watt size is no thicker than a lead pencil and it emits 65,000 lumens, or 65 lumens per watt, an extremely high efficiency. The lamp is expected to be used in searchlights, in photoengraving and for therapeutic uses.

The lamp may be operated on either a.c. or d.c. and the voltage drop is about 840 at 1¼ amp. It requires the usual accessories for operating mercury vapor lamps.

Silvered Bowl Diffusers

FOR general industrial lighting of low bays in machine shops and similar locations, the lighting division of *Westinghouse* has designed the RLM standard silver bowl diffuser for use with 300 or 500-watt silvered bowl lamps. The unit consists of a dome-shaped enameled reflector, an inner aluminum reflector of 18-gage sheet aluminum treated by the Alzak process, and a socket assembly. It is supplied either with Locklite hoods for both conduit and 4-in. outlet box mounting or as a one-piece unit for conduit mounting. The Locklite socket is described in a later paragraph.

THE *Benjamin Electric Mfg. Co.*, Des Plaines, Ill., has also announced a new silvered bowl diffuser

that meets RLM Standards Institute specifications. Through the proper combination of a porcelain enameled reflector and Alzak aluminum reflecting surfaces and the use of the silvered bowl, a softer, better diffused illumination is secured, without sacrificing high lighting efficiency. The aluminum reflector is located in the top of the unit and redirects the light from the silvered bowl lamp downward and outward. At the same time the enameled reflector shields the high brightness portions of the lamp. The new units are available in socket reflector and Turnlox type of hood construction.

Explosion-Proof Lighting Units

AN angle bracket type of explosion proof fixture suitable for hazardous locations in which inflammable volatile liquids and the like are manufactured or used is also announced by the *Benjamin Electric Mfg. Co.* The brackets and lighting fixture are designed with ample strength in the cast hood and glass globe to withstand an internal explosion, and the joints are flame proof to prevent flames escaping into the surrounding inflammable atmosphere. All fixtures are available with porcelain enameled steel reflectors in the dome, shallow dome, bowl and symmetrical angle shapes.

Locklite Lighting Unit

LOCKLITE is the name given a new principle of attaching industrial reflectors, said to speed installation, reduce maintenance and provide increased safety with interchangeability of reflector units. With this new *Westinghouse* device, it is impossible to light the lamp until the reflector is properly locked in place. Each unit consists of two parts: a hood and a receptacle into which the reflector with lampholder fits. When the lugs on the neck of the reflector lock into the slots of the hood, the electrical connection is made, accomplished by giving the reflector a clockwise turn of 60 deg.

Drafting Room Units

TWO types of indirect lighting units applicable in drafting rooms and similar commercial installations are announced by *Westinghouse*. GB Luminaires with glass basins, illustrated, are designed for use with incandescent medium Bipost lamps in either 750 or 1000-watt sizes. MB Luminaires, on the other hand, are totally indirect aluminum lighting units for use with the same type of lamps, including also the 500-watt size. The basin consists of an outer reflector spun from 18-gage aluminum and an

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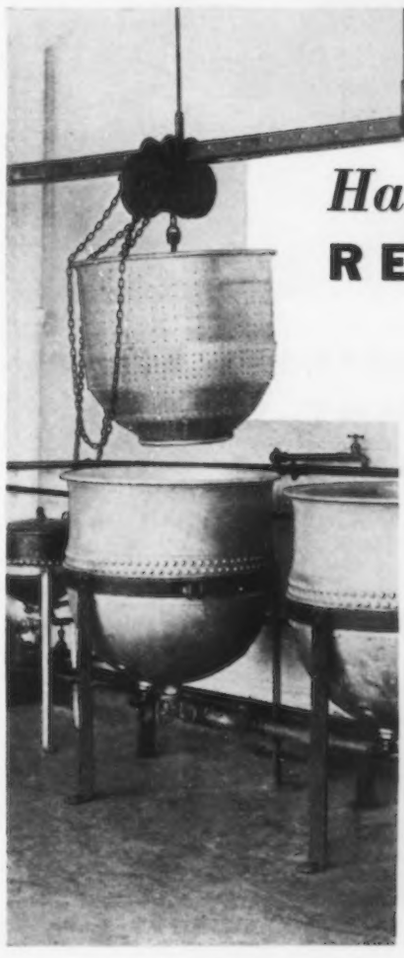

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A leading sea food products company moves these big vats in the boiling and packing department Reading style. Production has speeded up since the installation of this one-ton Reading Trolley Chain Hoist and T-rail. This unit ties in with a complete Reading handling system throughout the plant.

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inner reflector of 14-gage aluminum, both of which has a semi-diffuse reflecting surface.

The Argyle is a fixture for similar application designed by the *Goodrich Electric Co.*, 2900 N. Oakley Avenue, Chicago. The inside of the reflector is finished in white porcelain enamel, and the outside of the reflector, canopy and socket cover are finished in ivory porcelain enamel. This fixture is supplied with a ball swivel at the canopy, to permit the fixture to hang straight, and is available in two sizes to accommodate lamps from 150 to 500 watts.

Industrial Spot Lights

TWO new types of industrial spotlights are illustrated. One, made by *Westinghouse*, uses a new type of Mazda lamp with flared bulb, in which a modified paraboloid reflector is formed inside the bulb form by the use of a bright, metallic surface. One type is made of heat-resisting glass for outdoor use and comes in either a projector spot form, with a narrow, powerful beam, or as a flood lamp, with a wide beam. There is also a cheaper Mazda lamp, using soft glass and suitable only for indoor use. It is made only in spotlight form.

Corrosion-Resisting Conduit

A NEW development in protecting steel conduit from corrosion has recently been announced by *Walker Brothers*, Conshohocken, Pa. By a new process known as Walkerizing, a uniform coating of zinc is fused into the outside and inside walls of the steel tube. Over this is applied a second coating containing a new, inert substance, which offers strong resistance to acids, alkalis, and salt water. The galvanized coating alloys the zinc with the steel and is said not to crack or chip when the conduit is bent during installation.

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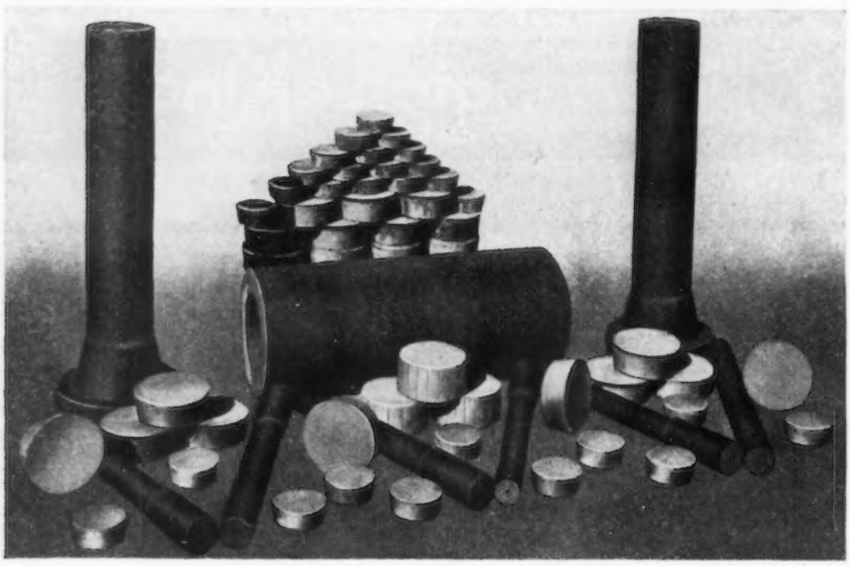
HOT WORK STEELS



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British Steel Trade Is Slowly Reviving

LONDON (*By Mail*).—Although British iron and steel market conditions continue rather quiet, there are signs that reviving demand in one or two sections of the industry may develop late in the year.

Trading has been on restricted lines in the pig iron department, according to the official report of the London Iron and Steel Exchange, but the stocks of foreign iron which have been weighing on the market for some months have been heavily reduced. Consumers, however, are still pursuing a cautious policy, and most of the business passing is limited to small orders for nearby delivery. To a great extent this may be due to expectations that when prices come up for revision a substantial reduction will be decided on.

The demand for most descriptions of semi-finished steel broadened appreciably during October, but many consumers still have substantial stocks to absorb before their requirements can be considered normal. Imports of this class of steel have been limited for some months, and the demand for the domestic product is gradually expanding.

In the finished steel section conditions continue irregular. The reserve of orders in the hands of the heavy steel works has fallen to a rather low level, and recently the demand has not been more than sufficient to prevent the reserve from declining. The absence of new shipbuilding orders is felt severely in this branch.

400 CIO Men Ignore Contract, Strike at U. S. Steel Shipyard

FOUR hundred employees of the Federal Shipbuilding & Dry Dock Co., a subsidiary of United States Steel Corp., this week walked out at the Kearny, N. J., yards in a strike held in violation of a contract between the Steel Corporation subsidiary and the Industrial Union of Marine & Shipbuilding Workers of America. Most of the men are welders.

The walkout, called by the shipbuilding union, an affiliate of John L. Lewis' Committee for Industrial Organization, after local union leaders charged that welding work had been "speeded up," hampered work on three destroyers being built for the Government. The management said there was no dispute over pay rates and that there had been no speeding up of work.

Federal Shipbuilding dismissed union leaders who ordered "a 50 per cent slowdown" in production and appealed to the workmen to observe their contract, which includes a clause calling for arbitration of all disputes. Instead, the welders struck.

The Industrial Union of Marine & Shipbuilding Workers has been active in attempting to organize workers at Quincy, Mass., Bath, Me., and at other shipyards along the Atlantic Seaboard. President of the union is John Green and secretary and treasurer is Philip Van Gelder.

Lucien Koch, former director of Commonwealth College, Mena, Ark., who has recently filed a $50,000 libel suit against publishers of THE IRON AGE and against James A. Rowan, its news editor, is a leading organizer for the Industrial Union of Marine & Shipbuilding Workers in the New England district. Mr. Koch's suit was filed by a New York law firm of which Lee Pressman, chief counsel for the CIO and for John L. Lewis, is a member.

Legislative Program May Help Railroads

WASHINGTON.—With the President's Emergency Board rejecting the proposal of railroads to cut wages 15 per cent, and indications that the carriers will accept the board's recommendation, efforts to solve their problem by a legislative rehabilitation program were considered at the White House, Monday.

Individual conferences were held by President Roosevelt with President J. A. Pelley of the Association of American Railroads, and George M. Harrison, chairman of the Railroad Labor Executives Committee, after which Mr. Pelley said Mr. Roosevelt had given assurance that the Administration would support a constructive rehabilitation program in the next Congress. The President also was represented as being hopeful that the recently appointed "informal committee" of three railroad management and three labor leaders will prepare a rail program which the Administration can support.

The Carriers Conference Committee will meet in Chicago on Friday.

It is expected that Chairman Enochs of the committee will ask that committee be discharged and that presidents of the railroads take back to their individual lines the matter of acting on the president's emergency board report.

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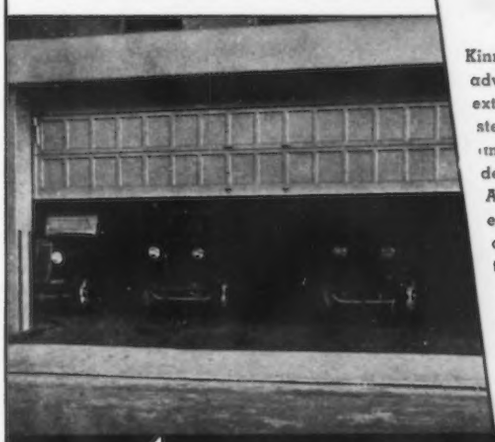
Economy in door operation and maintenance! That's what you are assured of when you install Kinnear RoL-TOP Doors. They open upward . . . easily and conveniently . . . out of the way of damage by wind or moving vehicles. They require no usable floor or wall space. Built to last (made of wood or steel . . . manual or motor operated) in any practical size, they provide the up-to-date solution to any commercial and industrial service door problems — and are ideal for your residence garage.

Wood!

Kinnear Wood RoL-TOP Doors are constructed to the finest mill standards, and with any number of sections arranged for glass. Where extra ruggedness is required, they are heavily reinforced across each section with Kinnear's special steel truss bars. Shiplapped sections are fitted with heavy malleable iron hinges secured with through carriage bolts (no screws), and operate as a unit on high grade ball-bearing rollers. Provided with a strong cylinder lock and Kinnear's ingenious "Keystone" sealing device, RoL-TOP Doors are burglar-proof and weathertight. These and other construction points give evidence that these doors have been designed in every detail for years of continuous service.



Steel!

Kinnear Steel RoL-Top Doors offer all the advantages of upward action plus the extra durability of heavy galvanized all steel construction. Interlocking sections and Kinnear's famous "Keystone" sealing device make them fully weather-tight. And, like the Wood RoL-TOP Door, they embody the perfect spring counterbalance, the continuous angle mounted tracks, the heavy malleable iron hardwear and other fine points of construction. In addition they are fireproof and vermin-proof . . . a practically wear-proof door that is readily adaptable to any size service entrance in any type of building.

THE KINNEAR MANUFACTURING CO.

1760-80 Fields Avenue Columbus, Ohio

. . . THE NEWS IN BRIEF . . .

D. Robert Yarnall, chief engineer of Yarnall-Waring Co., has been re-elected president of United Engineering Trustees.—**Page 35.**

G. E. builds addition to turbine shop. —**Page 35.**

New iron and steel statistics include Czechoslovakia.—**Page 39.**

Edsel Ford predicts 50 per cent increase in Ford production next year. . . . Entire industry optimistic. . . . New Dodge truck plant opened.—**Page 52.**

A new machine used to re-roll automobile trim scrap in a Detroit plan is described and illustrated. —**Page 54.**

New Deal confused as to attitude it should take toward steel industry problems, particularly prices.—**Page 56.**

Vanadium Corp. employees at Niagara Falls, N. Y., will vote before Nov. 12 in a National Labor Relations Board election.—**Page 58.**

NLRB rules against Employees' Service Committee as bargaining agency for Cincinnati Milling Machine Co. workers.—**Page 58.**

Maritime Commission denies rumors regarding ban on vessels utilizing diesel motor propulsion machinery.—**Page 58.**

Utilities will spend $1,000,000,000 yearly to expand nation's power as part of national defense program.—**Page 59.**

Northwestern Steel & Wire Co. licensed to produce lead-bearing steels.—**Page 60.**

Only one of 2300 associations receiving Monopoly Committee questionnaires has refused to cooperate, according to Department of Commerce representatives.—**Page 61.**

Value of manufactured aluminum products rose 59.2 per cent during 1937 to $165,643,275.—**Page 62.**

United States Steel Corp. seeks to sell real estate valued at $60,000,000, with $8,000,000 of excess properties already sold.—**Page 62.**

Great Britain's largest steel plant starting.—**Page 63.**

More rearmament work for British steel trade.—**Page 63.**

High grade ore deposit found in the Transvaal.—**Page 63.**

British steel trade is slowly reviving. —**Page 66.**

Four hundred members of CIO affiliate ignore contract with U. S. Steel Corp. subsidiary, quit work on three destroyers at Kearny, N. J.—**Page 67.**

September tin production ran 700 tons under August; U. S. share of tin plate production in first nine months of 1938 drops to 48 per cent.—**Page 74.**

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MEETINGS

Nov. 14—Society of Automotive Engineers, annual dinner, New York.

Nov. 16 and 17—Purchasing Agents' Association, Chicago.

Nov. 16 and 17—Porcelain Enamel Institute, Cleveland.

Nov. 25 and 26—American Foundrymen's Association, Purdue University, Lafayette, Ind.

Dec. 5 to 9—American Society of Mechanical Engineers, New York.

Dec. 5 to 10—National Exposition of Power and Mechanical Engineering, New York.

Dec. 15—Grinding Wheel Manufacturers Association, Atlantic City, N. J.

Dec. 16—Abrasive Grain Association, Atlantic City, N. J.

Midland Steel Products Co. will expand manufacturing space in Detroit by 31 per cent, buys Hupp property.—**Page 75.**

Federal Bureau of Mines progressing in deficiency metals study.—**Page 76.**

United States Bureau of Mines issues survey of 1937 consumption of the Irvin works.—**Page 77.**

General Motors Corp. subsidiary plans diesel-electric locomotive powerful enough to haul a complete freight train.—**Page 78.**

Employees of industry have a stake in its public relations, Eugene G. Grace, Bethlehem president, says. —**Page 79.**

Secretary of Labor Perkins receives Public Contracts Board's recommendations for minimum wages in the steel industry.—**Page 80A.**

Steel industry coke oven by-products during 1937 are valued at $155,500,000.—**Page 80B.**

Carnegie-Illinois Steel Corp. plans shortly to begin regular production on its new continuous mill at the Irvin works.—**Page 80B.**

CIO wins another victory through Labor Board decision involving production employees of Newark Rivet Works.—**Page 80B.**

For the first time in 1938 iron and steel exports from the United States in September advanced over the preceding month.—**Page 80B.**

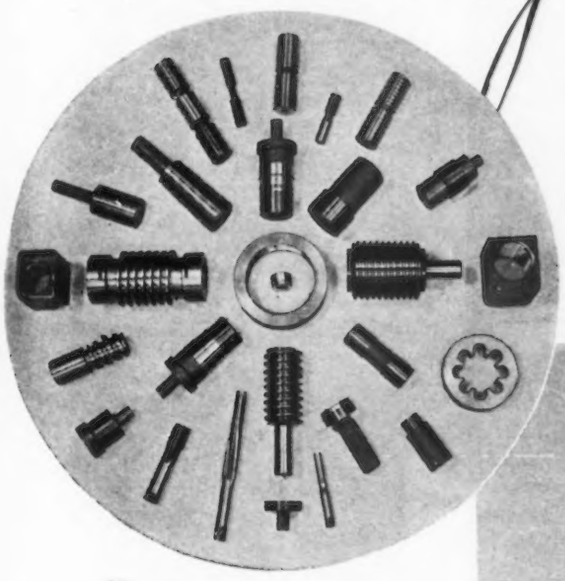
Bethlehem Steel Corp. reports small profit at 46.4 per cent operations in third quarter; National, Inland three-month profits exceed $1,000,000.—**Page 94.**

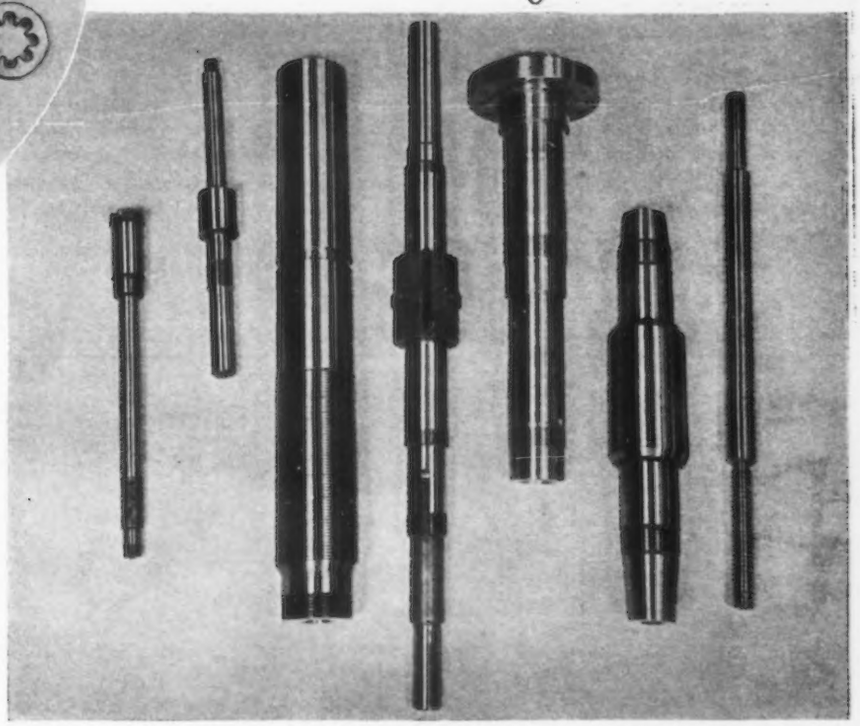
Bookings of structural steel were lower in September than in August but show a small improvement so far in 1938 when measured by quarters.—**Page 95.**

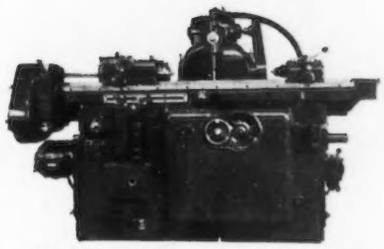
Hamilton Foundry & Machine Co. holds open house for employees and customers at Hamilton, Ohio. —**Page 95.**

Exhibits at the 1939 Machine and Tool Progress Exposition at Detroit expected to triple 1938 displays. —**Page 95.**

The long and the short of it!







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ABILITY to handle a variety of work is always useful. The J & L Automatic Thread Grinder has this ability to a remarkable degree. Short work, long work; threads of small diameter or of large diameter; fine or coarse pitches; single or multiple threads, right or left hand; are all handled by this versatile machine.

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Available in two sizes.

SEND SAMPLES OR BLUE PRINTS OF YOUR WORK FOR COMPLETE INFORMATION.

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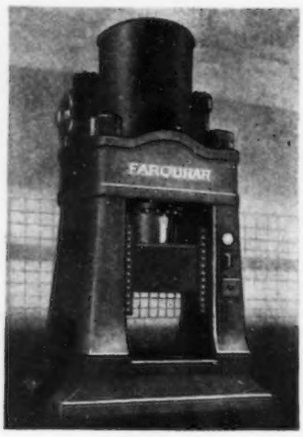
Hydraulic Presses are Lowering Costs for Others. Perhaps they could for you, too.



2000-Ton High Speed Double Action Press

700-Ton High Speed Press

York, Pennsylvania, is famed the world around for the mechanical excellence of its manufactured products. To the favorable manufacturing factors afforded by this industrial community, this eighty-year-young organization has added hydraulic engineering experience which brings you a composite of the best engineering practice. On a wide variety of products Farquhar presses are lowering manufacturing costs. Perhaps they could for you, too. We would like to discuss that possibility with you.

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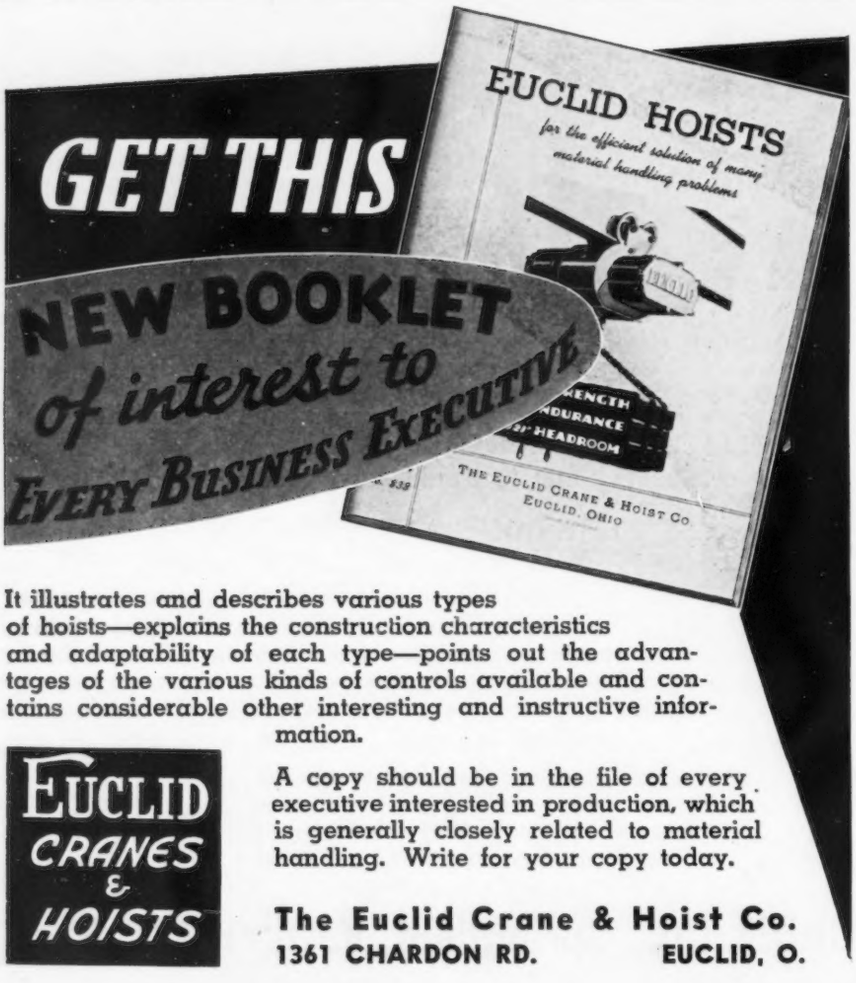

It illustrates and describes various types of hoists—explains the construction characteristics and adaptability of each type—points out the advantages of the various kinds of controls available and contains considerable other interesting and instructive information.

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. . . PERSONALS . . .

A. J. HAZLETT has been appointed manager of the strip-sheet sales department of Jones & Laughlin Steel Corp., Pittsburgh. He succeeds WILLIAM MILLER, who was recently appointed district manager of the company's Detroit office. Mr. Hazlett has been president of the Eastern Rolling Mill Co., Baltimore, since 1927. His entire business experience has been in the steel industry.

❖ ❖ ❖

HOWARD F. MACMILLIN has been elected president of Hydraulic Press Mfg. Co., Mt. Gilead, Ohio, succeeding his father, F. B. MacMillin, who died

A. J. HAZLETT

Sept. 8. Mr. MacMillin joined the company in 1921, in the capacity of sales engineer, upon being graduated from Massachusetts Institute of Technology. He then became sales manager, director, vice-president and for the last two years has been general manager, which position he continues to hold.

H. A. TOULMIN, JR., Dayton, Ohio, was elected as director to fill the unexpired term of F. B. MacMillin.

❖ ❖ ❖

F. H. FRANKLAND, chief engineer, American Institute of Steel Construction, presented a general description of the application of welding to recent structural and bridge jobs now in the process of design, involving both all-welded and welded and riveted structures, before the opening meeting of

the Pittsburgh section of the American Welding Society last week.

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JOHN M. COLLINS, treasurer of the Moore Drop Forging Co., Springfield, Mass., since 1933, has been made president to succeed the late Frank D. Fuller. Mr. Collins will continue to hold the office of treasurer. Mr. Collins went with the company from the Knox Automobile Co. HAROLD G. DICKEY, a vice-president of the company and associated with it since 1917, has been made general manager.

❖ ❖ ❖

JACOB D. SHERMAN, of Jackson, Mich., and C. L. VON EGLOOFSTINE, of New York, recently were added to the board of directors of Reynolds Spring Co. Mr. Sherman has been vice-president of the company for several years and three months ago was named general manager of several of its plants.

JOHN D. TEBBEN, whose appointment as sales manager of the metallurgical division of the P. R. Mallory & Co., Inc., Indianapolis, was announced in THE IRON AGE on Oct. 27. Mr. Tebben formerly was manager of the Detroit office of the company.

❖ ❖ ❖

EDWIN W. THOMAS, for the past 10 years assistant works manager of the Standard Steel Works Co., Burnham, Pa., has been appointed works manager. Mr. Thomas has been associated with Standard, which is a subsidiary of the Baldwin Locomotive Works, since 1909.

❖ ❖ ❖

J. E. MCMULLEN has been made controller of the Colorado Fuel & Iron

Their action, like their manufacture, is clean-cut, reliable, full of live responsiveness. Gibson leaves no stone unturned to give you full co-operation in quotations and deliveries. Problems in spring design, likewise, receive the experienced attention of men thoroughly schooled in the proper use of the various materials with good spring characteristics.

Give GIBSON an opportunity on your next order for
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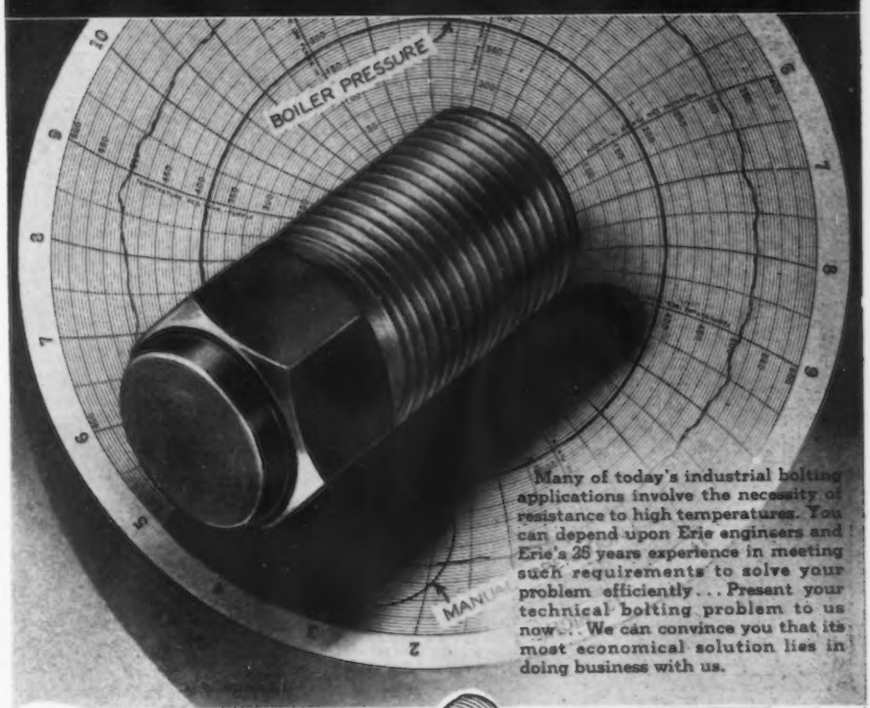
RESISTANCE TO *Temperature*



Many of today's industrial bolting applications involve the necessity of resistance to high temperatures. You can depend upon Erie engineers and Erie's 25 years experience in meeting such requirements to solve your problem efficiently... Present your technical bolting problem to us now... We can convince you that its most economical solution lies in doing business with us.

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Corp., Denver, Colo., and also of its subsidiary companies.

❖ ❖ ❖

HARRY L. FREVERT, president of the Midvale Co., Philadelphia, a subsidiary of the Baldwin Locomotive Works, has been elected a member of the board and of the executive committee of the latter company.

❖ ❖ ❖

CHARLES KNUPFER, who has been identified with the Carborundum Co., Niagara Falls, N. Y., since 1907, has been appointed vice-president. He has been general sales manager since 1936. HENRY P. KIRCHNER, who joined the company in 1919 and who has been works manager for the past 11 years, has also been appointed vice-president.

❖ ❖ ❖

ROBERT S. THURSTON, head of the sales engineering section of the General Electric air conditioning department for the past five years, has resigned to become general manager of the General Air Conditioning Co., G-E distributer in Memphis, Tenn.

❖ ❖ ❖

L. F. KINDERMAN, formerly identified with Republic Steel Corp. and with the Westinghouse Electric & Mfg. Co. in engineering capacities, has been made district sales representative in the Cleveland-Pittsburgh territory for Iron & Steel Products, Inc., Chicago. He will make his headquarters in Warren, Ohio.

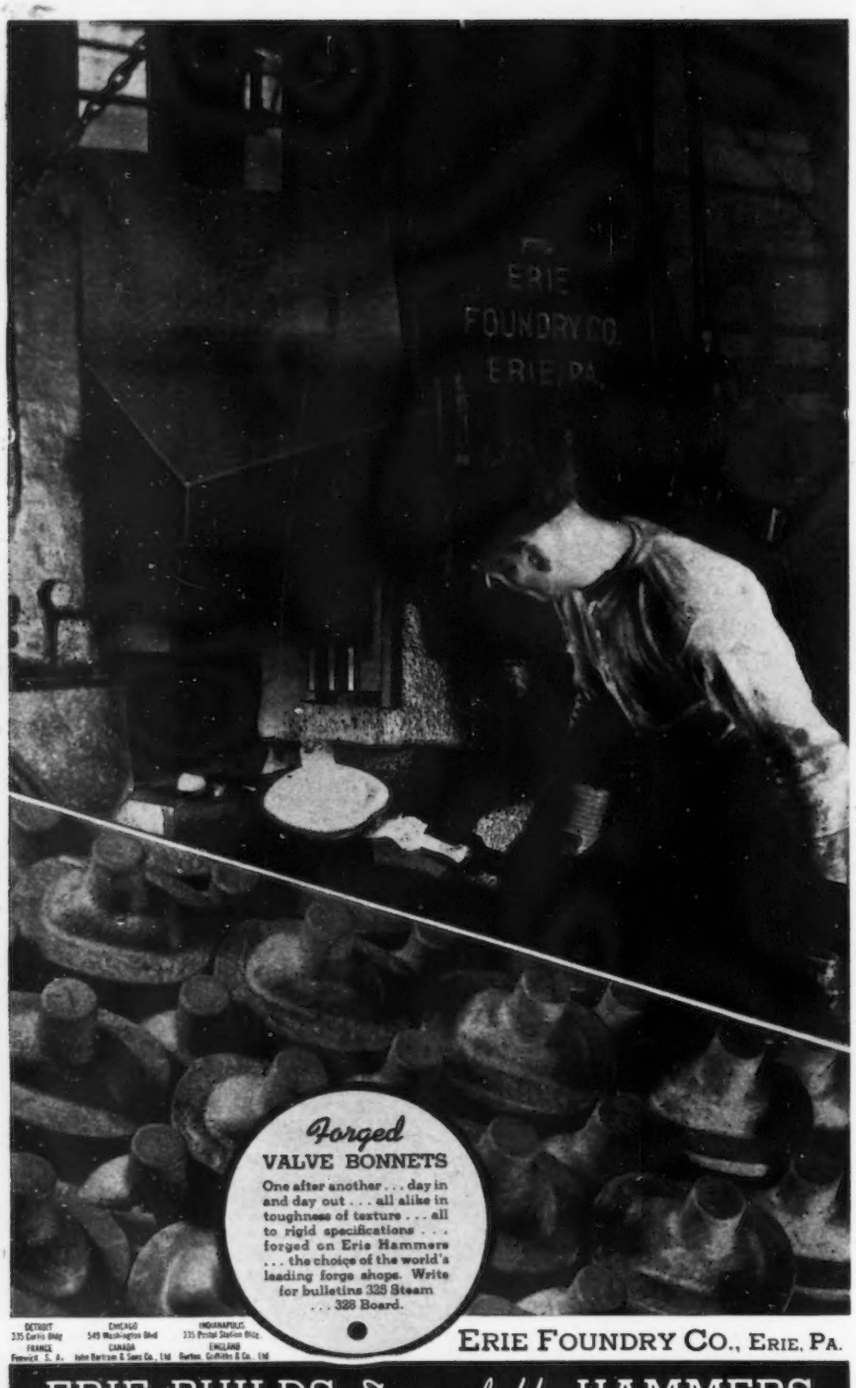
❖ ❖ ❖

GEORGE G. POST, vice-president of the Milwaukee Electric Railway & Light Co., Milwaukee, in charge of generating plants, has been elected president of the Engineers' Society of Milwaukee. DEAN FRANZ A. KARTAK, school of engineering, Marquette University, has been elected vice-president, and WALTER R. MUELLER, mechanical engineer with the Fred H. Dorner engineering sales organization, was re-elected secretary and treasurer.

❖ ❖ ❖

WILLIAM P. LANGWORTHY has been appointed director of the electrical materials division, Allegheny Ludlum Steel Corp., Pittsburgh. He was president of the Lamination Stamping Co., Hartford, Conn., until 1930, when the company was merged with Allegheny Steel Co., at which time Mr. Langworthy became manager of the fabrication division.

W. P. LANGWORTHY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. . . OBITUARY . . .

ARNOLD H. GOSS, 63 years old, an organizer of two of the world's largest corporations in the early days of the automobile and electrical refrigeration, was buried Oct. 24 near Ann Arbor, Mich. Mr. Goss, a native of Laingsburg, Mich., studied at Albion College and was admitted to the bar in 1902 but never practised law. In 1906 he became associated with W. C. Durant in launching General Motors Corp. In 1914 he organized and became first president of the Kelvinator Corp. He had been retired since 1928.

❖ ❖ ❖

WILLIAM PREIKSCHAT, retired assistant manager of the Pullman Co's Calumet shops, died Oct. 23 at his home in Chicago. Mr. Preikschat, who was 70 years old, had been with Pullman Co. from 1887 to his retirement in February, this year.

❖ ❖ ❖

HARRY LEE BRIDGES, purchasing agent for the American Tool Works, Cincinnati, died on Oct. 25 at Covington, Ky., after a brief illness. He was a member of the Cincinnati Association of Purchasing Agents. He was 52 years old.

❖ ❖ ❖

FRANK P. MEYER, since the first of the year manager of the engineering department of the Pittsburgh Piping & Equipment Co., Pittsburgh, died of pneumonia on Oct. 19, aged 55 years. He had been identified with the company since its founding in 1903. He had been chief engineer for many years.

❖ ❖ ❖

JOSEPH ELLSWORTH ZILK, mechanical engineer and inventor, was buried Oct. 26 at Ann Arbor, Mich. Mr. Zilk went to Ann Arbor as superintendent of steel work when Yost Field Athletic plant was erected and had been active in Ann Arbor since then. He was 77 years old.

❖ ❖ ❖

STEPHEN ABNER COCHELL, was buried in Detroit Oct. 25, on his 72nd birthday. Mr. Cochell was born in Monticello, Ind., went to Detroit 59 years ago and in his later years was president of Cochell Wheel Polishing Co. and the Michigan Gum Co. In his earlier years he was foreman of the polishing department of the Michigan Stove Co. and was one of the first organizers for the old Knights of Labor, an early workman's organization.

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JOHN G. QUADIE, 45 years old, production representative of the Fisher Body Corp. in Michigan, was burned to death on highway U.S. 16, a mile west of Lansing, Mich., on Oct. 27 when he lost control of his automobile and it crashed into a combined grocery store and gasoline station. Mr. Quadie, whose work required frequent visits to Fisher plants in Michigan, had been in Grand Rapids and was returning to Lansing when his car went off the pavement as he avoided a head-on collision with another car.

❖ ❖ ❖

EARLE MOORE PORTER, vice-president of Cobalt Inc., was buried Oct. 29 in Detroit. Mr. Porter was born at Wells Island, N. Y., 49 years ago and in 1905 went to Detroit. He was graduated from the Marine Engineering Department of the University of

Maximum Production at Minimum Cost

That's what Kemp Immersion Melting (with gas) is giving in *modern* tin stacks the world over. When tin pots are equipped for this better, faster, cheaper way of melting, no crew and no machine can out-step hot metal.

That's why the installation shown above was designed and built for Kemp Immersion Melting . . . making this an important part of one of the world's largest and most efficient tin-plate mills.

Remember, *speed* is only part of the Kemp story. Kemp also gives you more accurate, fully automatic temperature control, less dross and material savings in fuel. For details address **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Balto., Md.,-Oliver Bldg., Pitts., Pa.**

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The complete System of METAL SAWING supported by a *complete* line of modern equipment.

A Better Saw for every shop and situation.

The culmination of over 40 years of specialization in the design and improvement of metal sawing methods and equipment, the MARVEL Line includes:

Non-Breakable High Speed Hack Saw Blades. A "giant" Hydraulic Hack Saw of 18"x18" capacity. (The world's largest hack sawing machine.)

Full Automatic Production Hack Sawing Machines in two sizes equipped with either normal service automatic bar push-up or with special "heavy-duty" automatic bar push-up for extremely heavy work.

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Dry cutting, general utility Shop Saws, at extremely low prices.

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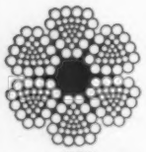
Style B Flattened Strand



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There is no guesswork when you use "HERCULES" (Red-Strand) Wire Rope. It is designed and built to do specific jobs better . . . safer . . . more economically. Furnished in a wide variety of constructions so as to be suitable for all purposes—each backed by 81 years of manufacturing experience and close co-operation with users.

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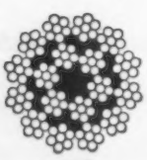
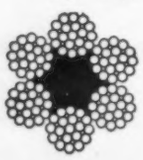
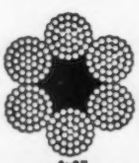


18x7 Non-Rotating



6x19 Filler Wire

6x19 Seale



6x37 Extra Flexible

8x19 Extra Flexible

Michigan, but for many years had engaged in the manufacture of cutting alloys.

❖ ❖ ❖

JAMES W. MATHEWS, a former assistant superintendent of the American Steel & Wire Co., at Cleveland, and an employee of the company 54 years until his retirement in 1929, died Oct. 27 in Cleveland.

❖ ❖ ❖

JUDSON E. WOLCOTT, JR., salesman for Williams & Co., Cleveland steel jobber, died Oct. 23 at his home in Lakewood, Ohio, at the age of 45. He had been associated with the Williams company two years, having previously been employed by the Chicago Steel & Wire Co., Chicago, for 10 years.

❖ ❖ ❖

DAVID DAVIS, secretary and a director of Ohio Iron & Steel Co., Lowellville, Ohio, died after a long illness at Youngstown, on Oct. 21 aged 77 years. He was secretary in charge of the company's offices at Lowellville until 1918 when the stock at Lowellville was sold to the Sharon Steel Hoop Co. He continued as secretary of the company.

❖ ❖ ❖

OTTO ADOLPH PEGAU, for a quarter century an active figure in the auto industry, was buried Oct. 28. Mr. Pegau, who was 52 years old, died in a Detroit hospital after a short illness. Born in St. Louis, Mo., he went to Detroit in 1910 and became associated with the Briggs Mfg. Co. He remained with Briggs until 1929, when he was vice-president and general manager. Since then, he has served as manufacturers' agent in the automotive field.

❖ ❖ ❖

MASON B. GIBERSON, SR., president of the National Foundry Sand Co., died in Detroit Oct. 24. Mr. Giberson was born Dec. 29, 1868, at Florence, N. J. Following an apprenticeship in New Jersey, he became a foundryman and served subsequently as an executive with various foundry companies. He went to Detroit 35 years ago and helped organize the company of which he was president. He was a member of the American Foundrymen's Association.

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ORMA R. BENJAMIN, construction engineer for the Detroit Edison Co. for 35 years, was buried Oct. 25. He died in a Detroit hospital after a year's illness. Mr. Benjamin was born in 1884 in Pittsfield, N. Y., and went to Detroit 45 years ago. He was a member of the Detroit Engineering Society and also an active boatman,

being commodore of the Edison Boat Club. In addition, he represented the American Olympic Union at the last two Olympics.

❖ ❖ ❖

JACOB GROESHEL, who in 1896 founded the firm bearing his name to manufacture a general line of tin and sheet steel products in Milwaukee, died on Oct. 22, aged 67 years. Since he became ill about nine months ago the business has been in charge of his eldest son, George Groeschel.

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SIR WILLIAM JOHN JONES, the famous British iron and steel engineer, died recently, after a long illness, at his home at Warlingham, England. He was 71. Sir John was a director of Dorman, Long & Co., Ltd.

During the War he was Director of Refractories. He was also Deputy-Controller of the Iron and Steel Productions Department of the Munitions Ministry and British representative on the Inter-Allied Steel Commission. After the War he was in charge of a commission appointed by the Munitions Ministry to examine the condition of the iron and steel works in Lorraine and the occupied areas of Germany.

❖ ❖ ❖

LEWIS B. CURTIS, president of Curtis & Curtis Co., Bridgeport, Conn., died at his home in that city on Oct. 25, aged 75 years.

❖ ❖ ❖

GUSTAF A. BERG, Glyptal sales specialist in the appliance and merchandise department of the General Electric Co., Bridgeport, Conn., died of a heart attack on Oct. 18 at his home in Monroe, Conn., at the age of 44 years.

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HARVEY E. EATON, president of H. E. Eaton Co., New York, which represents Michigan Tool Corp., Detroit, here and abroad, died at Medical Center, New York, on Oct. 25

Midland Steel Products To Expand Detroit Plant

CLEVELAND.—E. J. Kulas, president Midland Steel Products Co., has announced completion of negotiations for the purchase of additional manufacturing space which will increase the area of the company's Detroit plant by more than 31 per cent. The new space, on Mt. Elliott Avenue, directly opposite Midland Steel company's present Detroit plant, has been purchased from Hupp Motor Car Co.

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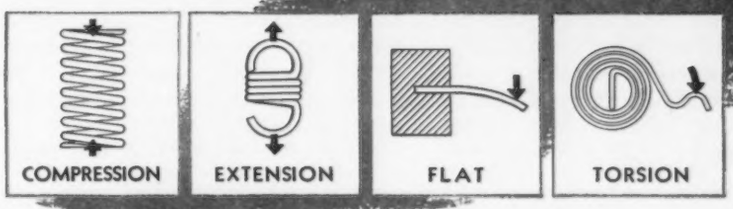

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Mines Bureau Progressing In Deficiency Metals Study

THE Federal Bureau of Mines is making progress toward determining the possibility of producing deficiency metals essential to armament and munitions from domestic ores and wherever possible to promote the production of these metals for peace-time use, Bureau Director John Wellington Finch told the convention of the Western Division of the American Mining Congress at Los Angeles on Oct. 26. The program, it was stated, includes such problems as the recovery of manganese, chromium, nickel, antimony, magnesium, and boron from well known, readily accessible mineral deposits.

Mr. Finch described bureau achievements in this field and their significance after pointing out the particular importance in the western part of the United States of the possibility of establishing electrometallurgical industries at points adjacent to adequate mineral supply and within easy reach of power developed by the various river-control projects. The bureau's approach on this problem, Mr. Finch said, has been based on the idea that the development of new materials for whose production the west has natural advantages would be of more value than an attempt to produce materials that are now made elsewhere, usually in ample quantities, by well-known methods.

Speaking of the bureau's work of recovery from low-grade domestic ores, Mr. Finch said that a method has been developed and several hundred pounds of high-purity electrolytic manganese have been produced from ores containing from 16 to 40 per cent manganese ore. This electrolytic manganese, said Mr. Finch, in contrast with the so-called pure manganese of commerce, which sells for about 40c. per lb., and contains amounts of aluminum and silicon that make it unsuited as a base metal for the preparation of alloys in the true sense, is an almost ideal material for an alloy base, and it is estimated that its cost will approximate 6c. or 7c. Mr. Finch explained that it has a silver color; that it is permanent in air and although brittle when pure, forms ductile alloys with relatively small additions of other metals. It was stated that its alloys with silver have been found to have exceptionally good properties for electrical contact material. Preliminary experiments were said to indicate that it may replace nickel and copper in such alloys as those of the monel, nickel-silver and stainless steel types.

"The method is applicable to oxide and carbonate ores, the former being given a reducing roast to make them soluble in sulphuric acid, said Mr. Finch.

"Our work on manganese has been very favorably received, and it is reasonably certain that the metallurgical industry will carry on to the eventual commercial production of electrolytic manganese which will serve as an emergency source for this essential ingredient of ferromanganese. Thus the first step of the program has been completed.

"Work is going forward, as our facilities permit, on the other objectives of the program, which of course, could be accelerated with additional

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funds. It now seems probable that our recently developed method for the production of high-purity chromium metal will soon be ready for release to the industry. This method is based on chlorination of chromite ore, followed by gaseous reduction of the chloride to metallic chromium.

"The laboratory phase of our investigation on the production of high-purity magnesium from magnesite is well in hand; and here again we are hopeful of overcoming the practical difficulties that have been encountered and of demonstrating the utility of a process that should make this valuable metal available in a high state of purity at a moderate cost.

"A start has also been made on investigations relating to the recovery of nickel from domestic ores, the development of methods for the production of boron and its alloys, and of the treatment of antimony ores and alunite."

Mr. Finch's discussion of processes to recover low-grade ores followed a statement that as a result of more exacting demands for performance under a given set of conditions, custom-made steels are becoming more important and the trend of American alloy steel production is steadily upward. The utility of such steels, he stated, is dependent upon the addition of one or more ferroalloying metals, including chromium, manganese, molybdenum, nickel, tungsten and vanadium.

Scrap Survey for 1937 Issued by Mines Bureau

TOTAL consumption of iron and and steel scrap in 1937 was 38,006,272 gross tons compared with 36,358,133 tons in 1936, according to the third annual survey of this kind by the Bureau of Mines, Washington. Of the total, 19,871,033 tons was home scrap and 18,135,239 tons was purchased scrap. The comparable figures for 1936 were 18,901,389 tons of home scrap and 17,456,744 tons of purchased scrap.

The report covers the consumption of scrap by states and districts and by types of furnaces.

In its general summary, the Bureau of Mines comments as follows:

"The total consumption of ferrous scrap and pig iron in 1937 increased 8 per cent over 1936. Of the 72,062,799 gross tons used, home scrap constituted 27.6 per cent, purchased scrap 25.2 per cent, and pig iron 47.2 per cent. In 1936 the percentages were 28.4, 26.3, and 45.3 and in 1935, 28.4, 27.8, and 43.8 per cent, respectively. Thus, in 1937 as compared with 1936 and 1935 relatively more pig iron and less purchased scrap were used, the total quantity of pig iron consumed having increased 13 per cent over 1936, whereas that of purchased scrap increased only 4 per cent. This trend undoubtedly reflected the higher prices for scrap in 1937, but the record does not indicate that this fact necessitated major adjustments in furnace operations in any section of the country.

"Consumption of ferrous raw materials in the iron and steel industries of the Southwestern, Pacific Coast, and New England states, which depend largely on scrap, compared favorably with the average for the entire country, the average percentage increase in the three regions being 9 compared with 8 for the entire country. The relative use of purchased scrap in these outlying areas decreased from 60 per cent of the consumption

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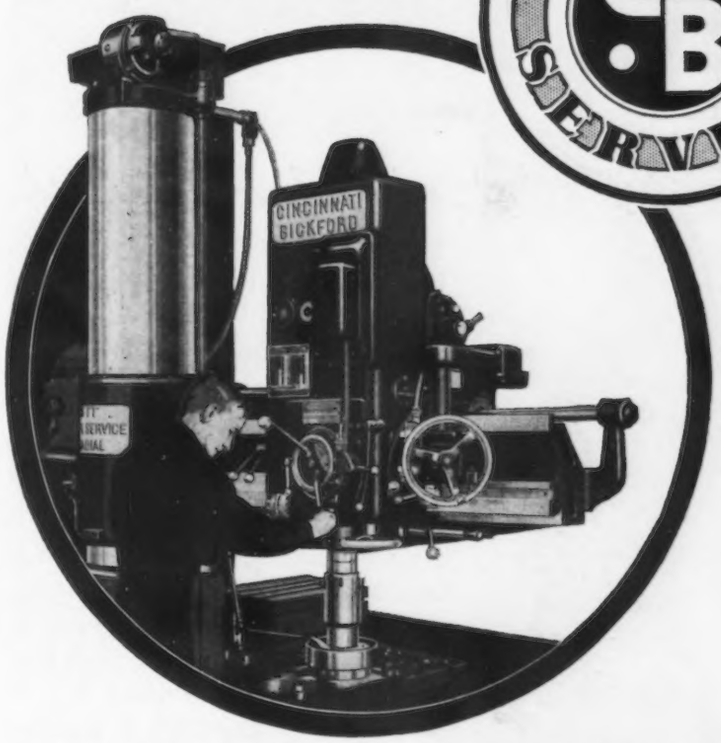

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of scrap and pig iron in 1936 to 56 per cent in 1937, but they utilized less than 7 per cent of the total purchased scrap used in 1937. In the six largest steel producing states, Pennsylvania, Ohio, Indiana, Illinois, New York, and Michigan, which in 1937 consumed 78 per cent of the total scrap and 82 per cent of the pig iron, the proportion of purchased scrap to total charge declined from 24 per cent in 1936 to 23 in 1937, due largely to more extensive use of pig iron in the open-hearth furnaces in these states.

"Higher scrap prices apparently had only slight effects on furnace operations in 1937. In open hearths, which use nearly three-fourths of the total ferrous scrap and pig iron consumed, the ratio of purchased scrap to total charge declined from 26.0 per cent in 1936 to 24.2 in 1937. A factor contributing to this decline was the increased output of duplex steel. This practice, however, was not so pronounced in 1937 as in previous years of comparable scrap prices.

"The importance of scrap from the viewpoint of conservation is illustrated by the relative amounts of scrap and ore used in the domestic iron and steel industry. In 1937 the total scrap consumed was equivalent to 119 per cent of the iron content of all domestic and foreign iron and manganiferous iron ores used in blast furnaces, and purchased scrap alone equaled 57 per cent of the iron content of the ores. In 1936 the percentages were 137 and 66."

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G-M Plans Powerful Diesel Locomotive

THE first diesel-electric locomotive sufficiently powerful to haul a complete freight train in regular service will be built by Electro-Motive Corp., General Motors subsidiary, some time next year, H. L. Hamilton, president of the corporation, has announced. Although still not beyond the engineering stage, Mr. Hamilton said, the plans call for a multiple-unit engine of between 5000 and 6000 hp.

Thus far, diesel-electric locomotives have been developed extensively for passenger trains and switching service, but not for road-haul freight trains.

Plans for the new locomotive, Mr. Hamilton said, are still in the "thinking stage." However, he pointed out, the milestone in perfection of diesel power has been reached where plans for the new engine can now be carried out. Railroads all over the country, particularly Western roads, for some time have been requesting Electro-Motive to develop such an engine, Mr. Hamilton disclosed.

Addition Is Opened

Announcement of the planned freight locomotive was made as trade paper and newspaper representatives gathered at the corporation's plant in LaGrange, Ill., to view the completed 300,000 sq. ft. addition. It was also the occasion of delivery from the plant of the most powerful diesel locomotive yet turned out, a 6000 hp. engine for the Seaboard Air Line Railway. This engine is in three units, each with two engines of 1000 hp. The Seaboard Air Line will place the locomotive in service on its crack train, the Orange Blossom Special, between Washington and Miami.

Electro-Motive officials stated that the expansion of its LaGrange plant makes it the most completely self-contained locomotive plant in the country. It increases the manufacturing area by approximately two-thirds to a total of approximately 14 acres. It brings under one roof complete facilities for the fabrication of diesel-powered switching and passenger locomotives, with the exception of certain castings that may be purchased more economically from outside sources due to the variety of their sizes and shapes.

One Locomotive Daily

The enlargement is the second since the plant was opened in January, 1936.

Employment has been increased to 2000. The original working force was 350. The plant now has a maximum capacity of one complete locomotive per working day.

"We now are manufacturing everything not requiring the services of a foundry or heavy forge shop, including the larger sizes of General Motors two-cycle diesel engines and the generators and traction motors that are used in the transmission system in our locomotives," said Mr. Hamilton.

There are 225 diesel locomotives built at the plant now in operation, Mr. Hamilton said. Of these, he revealed, 175 are in switching service and 50 in high speed passenger train operation.

. . . PIPE LINES . . .

Hope Engineering Co., 100 East Forty-second Street, New York, is considering new 8-in. welded steel pipe line from Wichita Falls, Tex., to Houston, Tex., over 350 miles, for crude oil transmission to terminal at last noted place.

Anadarko, Okla., plans steel pipe line for main water supply from wells in vicinity of municipality to filtration plant; also will consider cast iron pipe. Fund of $253,900 has been arranged for this and other waterworks installation, of which $117,900 will represent a Federal grant. Robert O. Bradley, Chickasha, Okla., is consulting engineer.

United States Engineer Office, Charleston, S. C., asks bids until Nov. 9 for 15-in., outside diameter, black steel suction pipe (Circular 41).

Bay St. Louis, Miss., has called special election Nov. 12 to approve bonds for $200,000 for steel pipe lines for natural gas distribution system, including main welded steel pipe line for connection with supply source. F. P. Joseph, Glenmora, La., is consulting engineer.

Brigham City, Utah, plans water pressure pipe line for water wheel operation for municipal power service. Cost about $18,400. Financing in part has been arranged through Federal aid.

Quartermaster, Fort D. A. Russell, Tex., closes bids Nov. 7 for welded steel pipe (Circular 550-8).

Delcambre, La., has called special election Nov. 22 to vote bonds for $25,000, with additional appropriation to be secured through Federal aid, for steel pipe line system for municipal natural gas distribution, including welded steel pipe line for connection with supply source.

Panguitch, Utah, closes bids Nov. 5 for about 30,000 ft. of 10-in. steel pipe for main water line, to replace in part existing wood pipe. Fund of $81,818 is available for this and other waterworks installation. J. H. Clark is engineer.

Warden, Detention Farm, LaTuna, Tex., closes bids Nov. 7 for steel pipe for gas transmission, including fittings, two pressure gas regulators, gas meters, etc. (Circular 1556).

Orange County Board of Supervisors, Santa Ana, Cal., has awarded approximately 20,000 ft. of 4-in. outside diameter black pipe to Mission Pipe & Supply Co., Los Angeles. Additional pipe will be awarded later.

Employees Have Stake in Public Relations, Grace Says

TAKING the position that the public relations of modern industry concern the employees of a company as well as the management, E. G. Grace, president of Bethlehem Steel Corp., elaborates on this philosophy of industry in the current number of the Bethlehem *Review*, a bulletin for employees, issued Nov. 1.

"Our activities," he says, "as managers and employees, like the activities in other large companies, have a marked effect on the prosperity of our immediate communities and on the well-being of the public at large."

Again, the bulletin says "A re-

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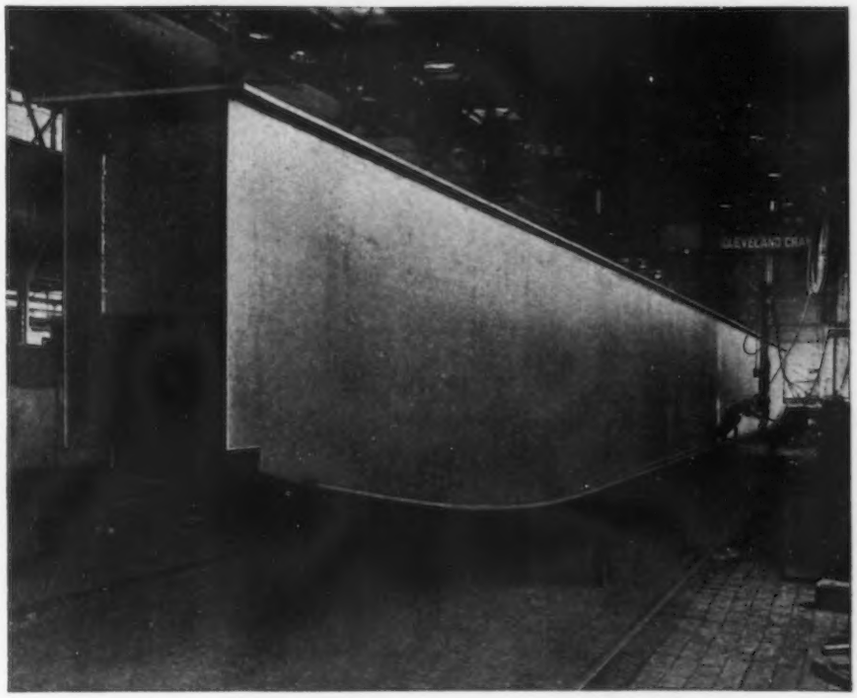

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sponsibility to the community has always been recognized by the Bethlehem Steel organization, both management and employees."

Among the facts published for the first time in the *Review* is a survey showing that Bethlehem Steel Corp.'s purchases from general suppliers amounted to more than $140,000,000 in the past year. Commenting on this and other data, Mr. Grace said: "The story of Bethlehem's growth is important to everyone who works for Bethlehem . . . but it has a still wider significance. Our steel products go into virtually every industry. Our payrolls stimulate trade not only in plant communities but elsewhere. Our purchases from suppliers affect many communities and businesses in various sections of the country. In fact, all of us in the Bethlehem organization are part of what has become one of the nation's great manufacturing resources."

Another innovation is that for the first time a calendar of growth of the corporation is presented, and presented initially to the employees. The concern has increased from 7500 employees in 1905 to 88,000 as of Jan. 1 this year, from 190,000 tons ingot capacity to 10,042,000 currently, from an initial investment of $40,000,000 to $666,000,000.

Bethlehem's huge inventory figure of $104,000,000, characteristic of steel, is elaborated on. The figure mainly includes ore piles and many other items necessary to supplying sudden demands, rather than finished steel. The requirements for the finished product are so diverse that stocks of finished goods are relatively light, but mills must be in readiness to swing into production, maintaining large reserves of raw and semi-finished materials.

A note of optimism for further growth is suggested in the final article "Building for the Future," commenting on the corporation's recently completed $90,000,000 program "the Bethlehem management prefers to regard the structure of today as only a foundation for the greater institution of the future."

It is brought out that the personnel is active in service clubs, welfare societies and fraternal bodies, and the company is a supporter of hospitalization, public health, education, recreation and other civic activities. For more than a decade the corporation has had a pension plan for employees and the employees' relief plan paid out more than a million dollars in the past year.

A novel example of employee and public activity at Steelton, Pa., is cited. During the short-work conditions of the depression a public park was built at Steelton by the volunteer labor of Bethlehem employees and other citizens providing permanent recreation facilities.

While recognizing the value of a wide range of community work, the *Review* comments: "The fundamental general welfare depends on good business conditions, good markets, and the uninterrupted flow of production."

Lunenfeld Disposing Of Pittsburgh Valve

PITTSBURGH.—Disposal of the machinery and equipment of the Pittsburgh Valve, Foundry & Equipment Co., liquidation of which plant was announced in September, is now being handled by Samuel Lunenfeld, sole owner, from the plant located at Twenty-sixth Street and A. V. R. R., Pittsburgh. This was previously conducted by Thomas J. Llewellyn.

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Automotive Welding Reviewed At A. W. S. Annual Meeting

IN addition to the sessions reported in THE IRON AGE of Oct. 27, the 19th annual meeting of the American Welding Society included two on automotive applications and a shipbuilding and a railroad session. With these, the program of the meeting, held at Detroit Oct. 16-21, was, as previously noted, unusually comprehensive.

The automotive sessions opened with a paper on "Flame Hardening," by John Sheppard, chief metallurgist, Kelsey Hayes Wheel Co., Detroit. Use of this process is not new, he pointed out, but considerable impetus has been given its use by the development of suitable mechanically-operated water-cooled tips and torches which assure accurate control and dependable operation. Hardening of extended areas, such as entire rail lengths, of cylindrical surfaces, and of gear teeth was outlined, and a section of the paper dealt with the various steels that may be flame hardened.

Auto Bodies Have 5000 Welds

Although admitting that present automobile body welding is a pretty high class piece of work, E. H. Foss, welding engineer, Murray Corp. of America, stated that "we should by no means feel that we have reached the ultimate. New sizes of sheets from the steel mills, new structural details off the board of the designer, new demands of a critical public, and the ever present slogan of engineering 'do it better at lower cost' demand new welding processes as well as better procedures for old methods."

The finished automobile body has in it some 5000 welds, he said. Butt welding and spot welding are mainly employed. The oxy-acetylene process was also said to adapt itself well to the automobile body industry. With recent developments manufacturers of oxygen and acetylene have given the industry many new features in control and distribution of gases. The present body plant has central distribution points from which both oxygen and acetylene are delivered through pipe lines to welding outlets at accurately controlled pressures. "An installation of this type permits use of the gas as easily as we use water, electricity or air," he said. In describing briefly the fabrication of the roof and underbody assemblies, Mr. Foss emphasized the basic role of jigs and fixtures.

Rear Axle Housings Resistance Welded

Manufacture of the rear axle housings for Chrysler cars, among the largest units now produced by electric resistance welding, was described in a paper by E. L. Bailey and V. Knecht, Chrysler Corp., Detroit, at the same session. The housing is made up of three flat plates resistance welded together and later pressed to the desired tubular form, which is then placed in a huge machine of the flash welding type. After the parts are clamped in the machine, the edges to be welded (100 in. long) are pushed together while a current of half a million amperes is applied for 7 sec. to produce the weld. Although the welding process is quite simple, the extraordinary power consumption of the welder (1000 kva.) has an effect on the electric system of the plant similar to suddenly opening a huge valve in a water supply system. To improve efficiency and reduce shock created by the welder on the power supply unique motor-generator equipment has been installed.

Papers at the second automotive session included: "Resistance Welding in the Automotive Industry," by A. Di Giulio; "Automatic Carbon Arc Welding in the Automotive Industry," by F. M. Maichle, Lincoln Electric Co.; "Use of Welding in Reconditioning Used Cars," by T. W. Moss, Chrysler Motors Service; and "Arc Welding of Road Equipment," by Elmer Isgren, superintendent, R. G. LeTourneau, Inc.

Lake Freighters Welded

Procedure in building of self-propelled diesel vessels 300 ft. long, 43 ft. beam, 12 ft. draft, 1946 gross tons was outlined by R. W. Brendle, welding foreman, Great Lakes Engineering Works, River Rouge, Mich., in a paper on "Erection Sequence and Welding Procedure of All-Welded Lake Freighters." The welded vessels were constructed as much as possible under the shop roof. After the keels were laid the shop-fabricated parts were butt welded in place, covered electrode being used. Erection was kept about one hatch space (two days) ahead of the finish welding. In general the welding was started at the center of the ship working outward to port and starboard, and to fore and aft in order to control distortion. Each of the two arc welded vessels was 89 days on the building ways. It was stated that the welded vessels are able to carry 15 per cent more cargo than their older, riveted sister ships.

"Welding in the Construction of Large Steel Yachts and Medium Size Commercial and Government Vessels," by W. E. Whitehouse, assistant manager, Defoe Boat & Motor Works, Bay City, Mich., and "All-Welded Steel Power Boats," by Milo Bailey, Bailey Steel Shipbuilding Co., were other features of this session.

The railroad session, held simultaneously with the ship session, coniprised three interesting papers. They were: "Arc Welding of Truss Type Railroad Cars," by A. M. Unger, welding engineer, Pullman-Standard Car Mfg. Co., Chicago; "Machine Gas Cutting in a Large Steel Foundry," by W. E. Murray, general foreman, steel foundry division, Canadian Car & Foundry Co., Ltd., and H. E. Horwood, Railway & Engineering Specialties, Ltd., Montreal; and "Flash Welding of Rails," by H. C. Drake, director of research, Sperry Products, Inc., Hoboken, N. J.

Secretary Perkins Has Steel Wage Decision

WASHINGTON. — The Public Contracts Board's recommendations for minimum wages in the steel industry were in the hands of the Secretary of Labor this week along with recommendations covering four other industries including the aircraft manufacturing industry, but there was no indication as to when the Secretary would take further action.

Persons close to the board expressed the view that the question of authorizing steel wage differentials based on plant size, a controversial point over which board members reportedly have wrangled for months, would not be approved by the Secretary in view of the solicitor's rather sweeping ruling in the pending soap industry case that such differentials are not sanctioned by the Walsh-Healey Act.

Although the board has not made public its steel wage recommendations, running some 150 mimeographed pages in length, it has been a foregone conclusion for months that geographical differentials, permitting the freezing of rates at existing levels in so far as possible, would be proposed for the industry.

Iron-Steel Export Downtrend Halted; Imports Also Up

FOR the first time this year export shipments in September of iron and steel products, excluding scrap, went up over the preceding month, bringing the month by month downward movement to a halt. The September trade totaled 196,395 tons valued at $11,176,437, in comparison with 134,110 tons valued at $8,810,925, in August, according to a preliminary report of the Metals and Minerals Division of the U. S. Department of Commerce.

Exports in the first nine months of 1938 amounted to 1,585,147 tons valued at $105,174,317, in comparison with 2,530,347 tons valued at $155,954,327 in the corresponding period last year.

Pig iron shipments in September moved up sharply to 66,600 tons and compared with 19,756 in August. The principal markets were Japan, 59,833 tons, and Germany, 5000. Black steel sheets totaled 16,610, the bulk being taken by the United Kingdom, 5876 tons; Canada, 3142 tons; Mexico, 1452 tons, and Brazil, 928 tons.

Rail and tin plate shipments continued high during September. Exports of rails amounted to 13,817 tons against 12,655 tons in August, and went to Hong Kong, 9500 tons, and Brazil, 3179 tons. Tin plate totaled 12,061 tons and went mainly to the Soviet Union, 4728 tons, and Canada, 1154 tons.

Exports of scrap in September totaled 149,673 tons valued at $2,093,925, in comparison with 108,029 tons valued at $1,478,545 in August. The leading markets were Japan, 60,619 tons; Italy, 32,202 tons; Germany, 20,433 tons, and the Netherlands, 19,144 tons.

The import trade also registered a gain in September, totaling 23,740 tons valued at $1,332,092, in comparison with 18,404 tons valued at $1,182,741 in August.

Pig iron imports amounted to 6922 tons against 961 tons in the preceding month and for the highest tonnage for any individual item. The outstanding source of supply was the Netherlands, which furnished 6820 tons. Ferromanganese and spiegeleisen receipts were second in importance, totaling 4956 tons, and came mostly from the Netherlands, 1579 tons, and Norway, 1411 tons. The third ranking product in the month's trade was steel pipe, aggregating 2339 tons, chiefly from Germany, 978 tons, Czechoslovakia, 514 tons, and France, 361 tons.

Receipts of iron and steel products, excluding scrap, in the first nine months of the current year amounted to 174,053 tons valued at $10,892,549, in comparison with 372,929 tons valued at $19,536,820 in the like period of 1937. The outstanding products imported during this period were pig iron, 29,184 tons; structural shapes, 28,691 tons; steel pipe, 21,469 tons, and hoops and bands, 19,384 tons.

Imports of scrap iron and steel during September were negligible, amounting to only 4218 tons and coming entirely from Canada.

Carnegie-Illinois' Irvin Works in Production Soon

PITTSBURGH. — A substantial closing of the gap between the Pittsburgh steel ingot output rate and that for the country is expected when Carnegie-Illinois Steel Corp.'s new Irvin works gets under way on regular production in the near future.

Test slabs for the new mill are being made this week at the Edgar Thomson works, Braddock, Pa., where a modern slabbing mill has just been completed. Steel making at this plant has been suspended for the past nine months due to the construction program.

Some steel which ordinarily would have been made at the Edgar Thomson works in the Pittsburgh district, has been furnished by other U. S. Steel plants in the Ohio Valley.

Both the new 44-in. slabbing mill at Edgar Thomson works and the new 80-in. continuous hot strip mill at the Irvin plant, will get their initial trial turnover this week.

Chances are that a fair supply of semi-finished steel will be made soon at the Edgar Thomson works in anticipation of regular sheet operations at the Irvin works later this year.

From a production standpoint, the Pittsburgh district will gain considerable support since eventually all steel to be made into sheets and tin plate at the Irvin works will come from Braddock, Pa. At the present time, hot rolled strip for cold reduced tin plate at the Irvin works is being supplied by the corporation's Youngstown strip mill.

Coke Oven By-Products Valued at $155,500,000

APPROXIMATELY $155,500,000 worth of gas, tar, oils and chemicals were produced by companies in the steel industry in 1937 as by-products from the manufacture of coke for blast furnace fuel, according to estimates by the American Iron and Steel Institute. Some of the by-products were sold, and others were used by the producers.

More than 52,700,000 net tons of coal were charged into the industry's by-product coke ovens last year, it is estimated, while 36,900,000 tons of coke were recovered.

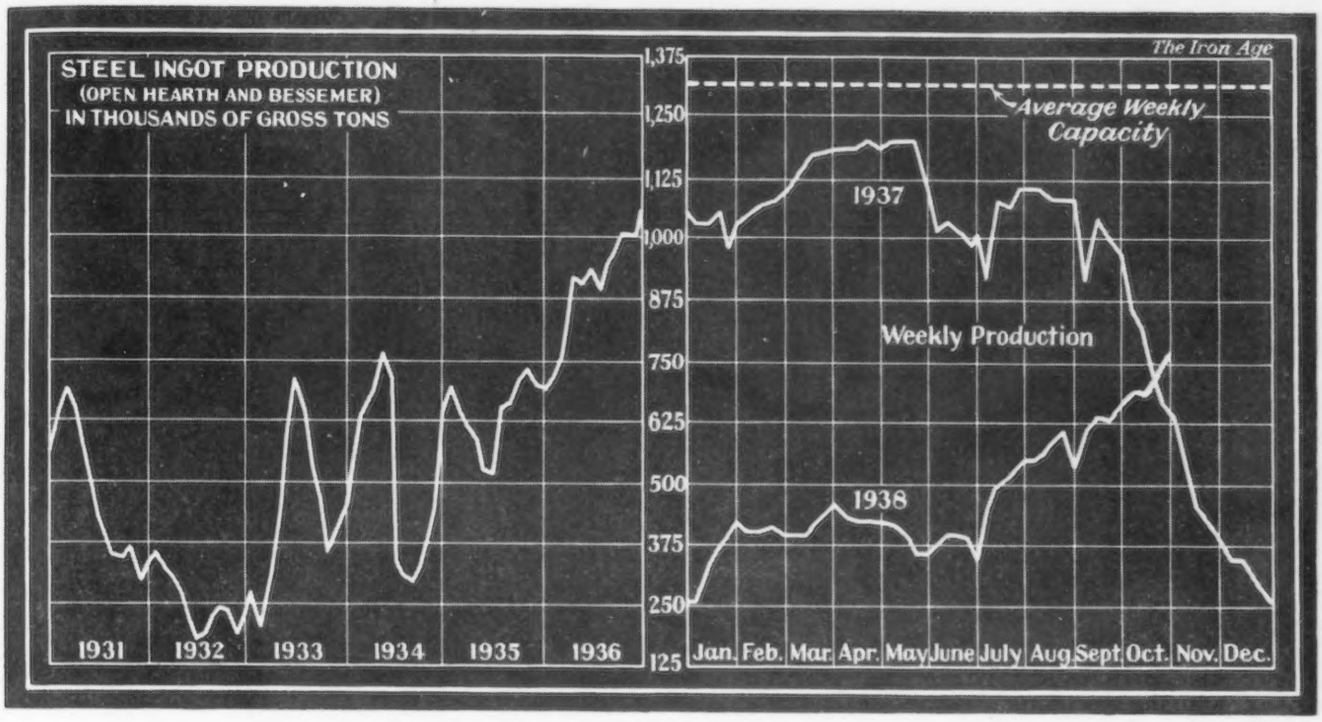
Of the total value of by-products, about $99,600,000 represented the value of the 582 billion cubic feet of gas yielded by the coking process. About one-third of the gas was used to heat the coke ovens, while the remainder was used as fuel elsewhere in the steel plants or was marketed.

An estimated 466,500,000 gallons of tar, valued at nearly $21,000,000 were likewise recovered.

Board Rules for CIO In Newark Case

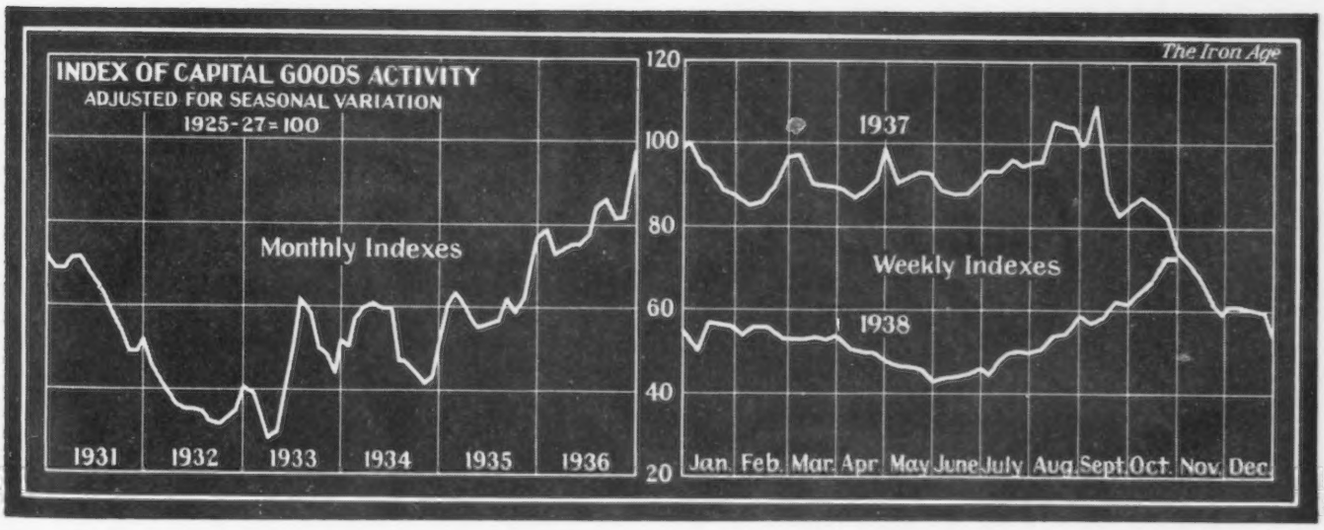
WASHINGTON. — The Newark (N. J.) Rivet Works has been ordered by the National Labor Relations Board to bargain collectively with the CIO's electrical, radio and machine workers union as the exclusive representative of production employes, to disband the Newark Rivet Works Employees' Council and to reinstate eight workers who allegedly were discharged and discriminated against because of union activities. Charges brought by the CIO union alleging the discharge of another employee were dropped by the board.

Ingot Output Up Another 3 Points to 57 Per Cent



District Ingot Production, Per Cent of Capacity	Pitts-burgh	Chicago	Valleys	Phila-delphia	Cleve-land	Wheel-ing	Buffalo	Detroit	Southern	S. Ohio River	Western	St. Louis	East-ern	Aggre-gate
CURRENT WEEK..	45.0	56.0	62.0	35.0	73.0	80.0	51.0	83.5	56.0	59.5	50.0	54.0	40.0	**57.0**
PREVIOUS WEEK..	42.0	46.5	61.0	31.0	72.0	78.0	49.0	77.5	49.0	55.5	50.0	49.0	40.0	**54.0**

Index Registers Small Gain for the Week



AGAIN of 0.4 point was registered by THE IRON AGE index of capital goods activity in the week of Oct. 29, raising the combined index figure to 73.6, the highest in 51 weeks. The failure of the index to show a gain comparable to the heavy gains of the past six weeks was due primarily to the failure of automobile assemblies to improve to the extent of the normal seasonal trend. Assemblies rose approximately 7 per cent in the past week, while the seasonal figures indicated a normal rise of 12 per cent.

	Week Ended Oct. 29	Week Ended Oct. 22	Comparable Week 1937	Comparable Week 1929
Steel ingot production[1]	75.3	71.4	71.2	111.0
Automobile production[2]	92.2	96.4	113.3	125.7
Construction contracts[3]	78.6	77.2	56.5	109.0
Forest products carloadings[4]	60.1	59.3	60.9	117.4
Production and shipments, Pittsburgh District[5]	61.8	61.8	77.2	113.5
Combined index	**73.6**	**73.2**	**75.8**	**115.3**

. . . SUMMARY OF THE WEEK . . .

. . . Ingot output up to 57 per cent; pig iron gains 18.3 per cent.

° ° °

. . . Heavy releases of sheets and strip aid operations.

° ° °

. . . Scrap stronger, based on large domestic and export orders.

A RISE of three points in steel ingot production to 57 per cent; a gain of 18.3 per cent in pig iron output in October, with a further increase already indicated for this month; substantial buying of steel scrap both for domestic consumption and export shipment, with a strengthening of prices which has lifted THE IRON AGE composite scrap quotation to $14.42, within 41c. of its high for the year, are outstanding indications of the somewhat faster tempo of business recovery in the iron and steel industry.

The gain in ingot production has been aided materially by large releases of sheets and strip, particularly from the automobile industry, against recent low-priced commitments, but there have been gains in some other products as well, October orders as a whole having risen 20 to 25 per cent over those of September.

Striking increases in ingot production have occurred at Chicago and Detroit. The Chicago rate is up nine and a half points to 56 per cent, one mill there having its sheet and strip rolling capacity in full operation, while at Detroit the independent steel plant there is running its open-hearth department at 100 per cent, and the average rate for Detroit, 83.5 per cent, is the highest in the country, the Wheeling-Weirton district coming a close second at 80 per cent.

Pig iron production for October is estimated at 2,054,000 gross tons, based on reports which were gathered by telegraph on Nov. 1. This compares with 1,680,435 tons in September. The daily rate last month was 66,258 tons against 56,015 tons in September, a gain of 18.3 per cent. There were 115 furnaces in blast on Nov. 1, a gain of 19 over the number in blast on Oct. 1. Two furnaces of the Carnegie-Illinois Steel Corp. in the Chicago district are scheduled to start production this week.

Steel scrap purchases by domestic mills within the past week may have amounted to as much as 100,000 tons. A 25,000-ton purchase at Chicago lifted quotations there an average of 75c. a ton. Export buying has also been on a large scale. Japan is believed to have bought close to 100,000 tons, and there have been additional sales recently to European countries. These transactions, together with rising ingot production, point to the possibility of a further rise in scrap prices.

FACTORS which are counted upon to bring a still higher level of steel operations during the next several weeks are these: Increasing specifications for sheets and strip as consumers face the possibility of a tight delivery situation; the release of some tin plate orders that have been held back pending the announcement of a 1939 price; the encouraging sales situation in the automobile industry, same makers being behind on deliveries; the possibility that the final settlement of the railroad wage question, disappointing as it was to the carriers, may result in the release of some essential requirements that have been long shelved; and the Government requirement that work shall be started on PWA projects by Dec. 31, which should bring the release of material already under contract and hasten the placing of pending contracts.

Steel awards for building construction are at a fairly steady level, with public work predominating. Lettings in the week were 18,400 tons, the largest of which was 6450 for buildings at the Philadelphia Navy Yard. New projects out for bids total 21,000 tons, of which 4500 tons is for hangars at the North Beach airport, New York. Reinforcing bar awards of nearly 10,000 tons include 4800 tons for the Queensbridge Housing project in Queens, New York.

The Southern Railway has ordered 2575 freight cars instead of the 2400 inquired for; 27,000 tons of steel or more will be required. The New York Central has ordered 29 Diesel-electric locomotives.

A STRIKE of 400 employees of the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., a subsidiary of the United States Steel Corp., is the first serious labor trouble the leading steel producer has experienced since its contract with the CIO was signed. The strikers are members of the Industrial Union of Marine and Shipbuilding Workers of America, a CIO affiliate. Although the company's contract calls for arbitration of all disputes, the men struck when their demands for a slowing down of production were not immediately acceded to. The shipyard is engaged in building three destroyers for the United States Navy.

A Comparison of Prices

Market Prices at Date, and One Week, One Month, and One Year Previous
Advances Over Past Week in Heavy Type, Declines in Italics

Rails and Semi-finished Steel

Per Gross Ton:	Nov. 1, 1938	Oct. 25, 1938	Oct. 4, 1938	Nov. 2, *1937
Rails, heavy, at mill	$40.00	$40.00	$40.00	$42.50
Light rails: Pittsburgh, Chicago, Birmingham	40.00	40.00	40.00	43.00
Rerolling billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Sheet bars: Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point	34.00	34.00	34.00	37.00
Slabs: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point	34.00	34.00	34.00	37.00
Forging billets: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham	40.00	40.00	40.00	43.00
Wire rods: Nos. 4 and 5, Pittsburgh, Chicago, Cleveland	43.00	43.00	43.00	47.00
Skelp, grvd. steel: Pittsburgh, Chicago, Youngstown, Coatesville, Sparrows point, cents per lb.	1.90	1.90	1.90	2.10

Finished Steel

Cents Per Lb.:				
Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.25	2.25	2.25	2.45
Plates: Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont	2.10	2.10	2.10	2.25
Structural shapes: Pittsburgh, Chicago, Gary, Buffalo, Bethlehem, Birmingham	2.10	2.10	2.10	2.25
Cold finished bars: Pittsburgh, Buffalo, Cleveland, Chicago, Gary	2.70	2.70	2.70	2.90
Alloy bars: Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton	2.80	2.80	2.80	3.00
Hot rolled strip: Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown, Birmingham	2.15	2.15	2.15	2.40
Cold rolled strip: Pittsburgh, Cleveland, Youngstown	2.95	2.95	2.95	3.20
Sheets, galv., No. 24: Pittsburgh, Gary, Sparrows Point, Buffalo, Middletown, Youngstown, Birmingham	3.50	3.50	3.50	3.80
Hot rolled sheets: Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown	2.15	2.15	2.15	...
Cold rolled sheets: Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown	3.20	3.20	3.20	...
Wire nails: Pittsburgh, Chicago, Cleveland, Birmingham	2.45	2.45	2.45	2.75
Plain wire: Pittsburgh, Chicago, Cleveland, Birmingham	2.60	2.60	2.60	2.90
Barbed wire, galv.: Pittsburgh, Chicago, Cleveland, Birmingham	3.20	3.20	3.20	3.40
Tin plate, 100 lb. base box: Pittsburgh and Gary	$5.35	$5.35	*$5.35	$5.35

*Pittsburgh prices only.

Pig Iron

Per Gross Ton:				
No. 2 fdy., Philadelphia	$22.84	$22.84	$21.84	$25.76
No. 2, Valley furnace	21.00	21.00	21.00	24.00
No. 2, Southern Cin'ti	21.06	21.06	21.06	23.69
No. 2, Birmingham	17.38	17.38	17.38	20.38
No. 2, foundry, Chicago†	21.00	21.00	21.00	24.00
Basic, del'd eastern Pa.	22.34	22.34	21.34	25.26
Basic, Valley furnace	20.50	20.50	20.50	23.50
Malleable, Chicago†	21.00	21.00	21.00	24.00
Malleable, Valley	21.00	21.00	21.00	24.00
L. S. charcoal, Chicago	28.34	28.34	28.34	30.04
Ferromanganese, seab'd carlots	92.50	92.50	92.50	102.50

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.

Scrap

Per Gross Ton:				
Heavy melting steel, P'gh	$14.75	$14.75	$15.25	$14.75
Heavy melting steel, Phila.	14.75	14.75	14.75	14.75
Heavy meltng steel, Ch'go	**13.75**	13.00	12.75	13.75
Carwheels, Chicago	**13.75**	13.25	13.25	16.00
Carwheels, Philadelphia	16.75	16.75	16.75	17.75
No. 1 cast, Pittsburgh	15.50	15.50	15.50	17.25
No. 1 cast, Philadelphia	16.75	16.75	16.75	17.75
No. 1 cast, Ch'go (net ton)	12.25	12.25	12.25	12.25
No. 1 RR. wrot., Phila.	15.25	15.25	15.25	17.75

Coke, Connellsville

Per Net Ton at Oven:				
Furnace coke, prompt	$3.75	$3.75	$3.75	$4.25
Foundry coke, prompt	4.75	4.75	4.75	5.00

Non-Ferrous Metals

Cents per Lb. to Large Buyers:				
Electrolytic copper, Conn.	11.25	11.25	10.375	11.75
Lake copper, New York	11.375	11.375	10.50	12.125
Tin (Straits), New York	46.50	46.50	43.625	47.75
Zinc, East St. Louis	5.05	5.05	4.95	5.75
Zinc, New York	5.44	5.44	5.34	6.10
Lead, St. Louis	4.95	4.95	4.95	5.35
Lead, New York	5.10	5.10	5.10	5.50
Antimony (Asiatic), N. Y.	14.00	14.00	14.00	17.25

On export business there are frequent variations from the above prices. Also in domestic business, there is at times a range of prices on various products, as shown in our detailed price tables.

The Iron Age Composite Prices

	Finished Steel	Pig Iron	Steel Scrap
November 1, 1938	2.286 a Lb.	$20.61 a Gross Ton	$14.42 a Gross Ton
One week ago	2.286	20.61	14.17
One month ago	2.286	20.44	14.25
One year ago	2.512c.	23.25	14.42

Based on steel bars, beams, tank plates, wire, rails, black pipe, sheets and hot-rolled strip. These products represent 85 per cent of the United States output.

Based on average basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	High	Low	High	Low	High	Low
1938	2.512c., May 17	2.211c., Oct. 18	$23.25, June 21	$19.61, July 6	$14.83, Aug. 9	$11.00, June 7
1937	2.512c., Mar. 9	2.249c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.92, Nov. 16
1936	2.249c., Dec. 28	2.016c., Mar. 10	19.73, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.062c., Oct. 1	2.056c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 23
1934	2.118c., Apr. 24	1.945c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.953c., Oct. 3	1.792c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.915c., Sept. 6	1.870c., Mar. 15	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.981c., Jan. 13	1.883c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.192c., Jan. 7	1.962c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.223c., Apr. 2	2.192c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.192c., Dec. 11	2.142c., July 10	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.402c., Jan. 4	2.212c., Nov. 1	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 17	13.08, Nov. 22

. . THIS WEEK'S MARKET NEWS . .

STEEL OPERATIONS

. . . Rate for country rises to 57% . . . Sheet-strip mills active

AIDED primarily by specifications against recent heavy commitments for sheets and strip, steel ingot production has risen three points this week to 57 per cent and further gains are in prospect.

A gain of nine and a half points to 56 per cent in the CHICAGO district is almost solely due to sheet and strip releases. One mill there is operating its finishing capacity in these products at virtually 100 per cent. The largest share of the releases has come from the automobile industry.

At DETROIT the Great Lakes Steel Corp. is operating at 100 per cent of capacity and the Ford Motor Co. has four of its largest open hearth furnaces on, bringing the average rate at DETROIT up to 83.3 per cent, highest of the year so far. It is expected that operations in that area will hover around 85 per cent during the remainder of the year.

Ingot output at PITTSBURGH has advanced three points to 45 per cent, while the WHEELING-WEIRTON area is up two points to 80 per cent.

The CLEVELAND-LORAIN rate is up one point to 73 per cent and the YOUNGSTOWN operation is also up a point to 62 per cent.

Higher rates are also in effect in the BIRMINGHAM, BUFFALO, ST. LOUIS, SOUTHERN OHIO and EASTERN PENNSYLVANIA districts.

NEW BUSINESS

. . . Orders in October 20 to 25% over those of September

FOR the industry as a whole, steel bookings in October reflect at least a 20 to 25 per cent increase over September. Best showing will be among companies making flat rolled products. Aside from sheet and strip volume, however, there has been a substantial rise during the past month in hot rolled bar and semi-finished steel orders. Part of this improvement is directly or indirectly due to the step-up in automobile production. Shipping instructions on recently booked flat rolled orders are staggered between now and Dec. 15, with a certainty that production will continually increase from week to week, reaching a peak in December.

The automobile industry stands out as the most important single market for CHICAGO district mills. Most of the large sheet and strip tonnage already on the books is for the automobile makers and most of the improvement in bar orders comes from the same source. Revival in demand for the latter has been fairly pronounced in the past week as the result of removal of the price uncertainty. Orders from the tractor manufacturers are picking up but demand from the implement industry is said to be slow at showing any measurable upturn.

Steel markets have an increasingly firmer tone in NORTHERN OHIO, from the standpoint of both incoming orders and prices paid. Shipments are on the increase and will improve with additional releases issued by sheet and strip consumers against the large backlogs held by mills.

In the SOUTH bookings are very satisfactory. New tonnage is made up of miscellaneous orders with sheets, wire products and merchant bars the most active.

PRICES

. . . Sheets and strip firm at recently restored levels

PRICES on sheets and strip are firm at the levels recently restored. Clarification of the price situation has had a stimulating effect.

There is a tendency toward a firmer price level in other products that have recently been subject to sharp concessions, although all weakness has not yet disappeared.

IRON ORE

. . . October shipments from Upper Lake ports top September

October shipments of Lake Superior iron ore from Upper Lake ports totaled 3,624,416 gross tons, compared to 3,284,800 tons in September and 6,562,035 tons in October, 1937, according to the report of the Lake Superior Iron Ore Association. The cumulative total for the season up to Nov. 1 this year is 17,781,706 tons, a decrease of 43,392,451 tons from the 61,174,157 transported up to Nov. 1 last year. One steel company is understood to have completed its shipments for this season and another company will wind up the season within a week.

PIG IRON

. . . Shipments in October higher in some districts

AN estimate of pig iron production in October is published on page 93 of this issue.

The BIRMINGHAM district is achieving a record in pig iron production, now having 16 of its 18 furnaces active. The Tennessee Coal, Iron & Railroad Co. on Monday blew in the last of its idle furnaces, No. 6 at Ensley, and is producing iron at capacity. The furnace had been idle since Feb. 23, 1938, during which time it underwent extensive repairs.

Another steel company furnace, long out of blast, to go in within the past week is Republic Steel Corp.'s rebuilt stack at Canton, Ohio, now rated at 600 tons a day after rebuilding. This furnace has been out of service for a year. Carnegie-Illinois will blow in two more furnaces this week, one at GARY and one at SOUTH CHICAGO.

Although there is not much new business in any of the principal market centers, shipments in October in most instances ran well ahead of those of September. In the CHICAGO district a leading seller reports a 25 per cent gain, with a further increase expected this month. NORTHERN OHIO producers estimate their gains in shipments at from 18 to 22 per cent. A small increase in shipments at PITTSBURGH is attributed mainly to better production at sanitary ware and radiator plants and larger takings by non-integrated steel plants. The CHICAGO improvement is accounted for largely by foundries serving the automobile industry, a secondary factor being requirements of tractor plants. In the ST. LOUIS district the melt has improved, partly because of stove and agricultural implement requirements, though steel mills and jobbing foundries are also using more iron.

In the East the situation does not seem to show as much improvement as is shown in the Middle West. NEW

ENGLAND foundries are working only two or three days a week; in the NEW YORK and PHILADELPHIA territories jobbing foundries have experienced a falling off in business, and heater plants, whose requirements have been a sustaining factor, are reaching the end of their active season.

A newcomer in the pig iron export market is Germany, which in the recent past has placed two 5000-ton orders with NEW YORK sales offices.

SEMI-FINISHED STEEL

. . . Orders larger in October than in September

TOTAL bookings of semi-finished steel in October in the PITTSBURGH district are considerably larger than in September. The upward trend which has continued in the past week has been due to greater activity at non-integrated steel plants, where order books reflect better bar, wire and flat-rolled business.

PLATES

. . . Price Weakness Persists in East . . . Car tonnage to be placed soon

ALTHOUGH the recent withdrawal of concessions on sheets and strip has sentimentally aided the plate market, price concessions on plates have not entirely disappeared, particularly in the East, where cuts of $2 and $3 a ton have been made within the past week. Some mills, however, state that they are adhering to published prices, but are losing business.

The orders placed by the Southern Railway for 2400 cars (details under heading Railroad Buying) will call for about 27,000 tons of steel, mostly plates and heavy sheets. There will also be a fair-sized plate tonnage in 29 locomotives ordered by the New York Central. About 375 tons will be required for 25 tenders to be built by the Pennsylvania Railroad.

Bids on 6200 tons of plate and 3184 tons of plates, sheets and strip to be used in construction of the U. S. destroyer *Fulton* at the Mare Island (Cal.) Navy Yard will be taken Nov. 4. Contract for a Geodetic Survey requiring about 900 tons of plates went to the Lake Washington shipyards, Seattle, Wash.

EASTERN PENNSYLVANIA mills experienced a small gain in orders in the past week after several weeks of slow business. The market is very quiet at CHICAGO, though at ST. LOUIS fair amuont of business for tanks and building construction has been placed. In the CLEVELAND and YOUNGSTOWN districts demand for plates has been a little lighter recently. Producers in that area believe, however, that prices being realized from sales of plates are a little higher than they were a month ago.

An Italian inquiry for 20,000 tons of plates and shapes for ship work, which was before the trade several months ago and on which no action was taken, has been revived.

Market Sidelights

Van Dorn Iron Works Co., Cleveland, manufacturer of steel prison and jail equipment, has been awarded a sub-contract for approximately $500,000 worth of prison equipment for the State Industrial School for Boys at White Hill, Cumberland County, Pa.

* * *

Preparing for the start of construction on the new toll highway from Pittsburgh to Harrisburg, a Warren, Ohio, manufacturer of picks, shovels, sledges and other hand tools has started shipment of 17,000 sledges.

* * *

Empire Sheet & Tin Plate Co., Mansfield, Ohio, is recalling more than 100 additional men this week, raising employment to 1000 and increasing operations to 60 per cent of capacity, which is expected to be maintained over the balance of this year, according to its president, James M. Hill.

* * *

Massachusetts will spend approximately $19,500,000 on roads and bridges destroyed by floods.

* * *

Wickwire Spencer Steel Co.'s Worcester, Mass., Goddard works early next spring will be moved to a plant now under construction in Buffalo. The company's Greendale, Mass., Morgan spring works is not to be moved. The move will be made in the interest of lower freight rates.

* * *

Only one of the iron mines of the Tennessee Coal, Iron & Railroad Co. is now idle, No. 8 at Wenonah, which is shut down for repairs. Production has been resumed at mine No. 10 at Wenonah, which had been idle since June, 1938.

STRUCTURAL STEEL

. . . Navy work at Philadelphia takes 6450 tons

THE Navy Department has awarded contracts for buildings at the Philadelphia Navy Yard that will require 6450 tons of structural steel. Bethlehem Steel Co. shared in this work to the extent of 3825 tons, while American Bridge Co. was awarded 2625 tons. Pending work in the East includes 4500 tons for three additional hangars at North Beach (N. Y.) airport and 2200 tons for the Brooklyn Navy Yard, on which the Hudson Contracting Co., New York, was low bidder on the general contract.

Navy work also is an outstanding item on the Pacific Coast. A previous award of four Navy hangars on San Clemente Island, Cal., has been rescinded and the project has been awarded to Los Angeles Contracting Co., Los Angeles; about 1350 tons of shapes will be required. The U. S. destroyer tender *Fulton* to be built at the Mare Island Navy Yard will require about 645 tons of shapes.

At CHICAGO the outstanding inquiry is for 1600 tons for a bridge over the Missouri River at Rulo, Neb.

American Bridge Co. has been awarded an office building addition in Baltimore calling for 1100 tons. It will also furnish 750 tons for a grade cross elimination at Woodbridge, N. J.

A new school to cost $1,500,000 is to be built at Kenmore, N. Y.; bids on the general contract are due Nov. 17.

(Details of fabricated structural steel awards and inquiries will be found on page 80A).

SHEETS AND STRIP

. . . Specifications against low-priced orders are gaining

THE possibility of a tight delivery situation in sheets and strip between now and the end of the year is envisaged by steel mills as specifications against recent low-priced commitments pile up. Mills are therefore urging their customers to get in specifications early. Some of them apparently need no urging as they had waited as long as they could while prices were weak and now are in need of replenishment.

Surprisingly as it may seem, in view of the recent heavy commitments, some new tonnage has been placed at the restored prices by consumers who

"missed the boat" during the brief period of acute price weakness.

The sharp increase in releases of sheets and strip is largely responsible for a gain of nine and a half points in ingot production in the CHICAGO district this week. At least one important producer there is speeding up finishing capacity in these flat rolled products to practically 100 per cent. Indications are at CHICAGO that it will take until Dec. 15 at least to roll the recent commitments. Buying for first quarter requirements is expected to come in the latter half of December; some, though not all, consumers will carry some inventory over into the new year.

Delivery promises on sheets are running from two to three weeks in the East and four to five weeks in the Middle West. Some sheet sellers in the NEW YORK area are encouraged by the fact that releases against recent commitments are being rushed to the mills, indicating that consumers may have underestimated their needs for the remainder of the quarter.

Prices appear to be firm at the restored levels.

RAILROAD BUYING

. . . Southern Railway distributes orders for 2400 freight cars

ALTHOUGH the railroad wage decision was obviously a disappointment to the carriers, they have apparently acquiesced and the atmosphere has been cleared of a situation that has tended to keep the railroads out of the market for many months. During this time requirements have been accumulating, and it is expected that some of the most pressing of them will be translated into orders within the next few months.

Subject to approval of the Interstate Commerce Commission, the Southern Railway has distributed orders for 2575 freight cars as follows: 1300 box cars to the Pullman-Standard Car Mfg. Co.; 1000 gondola cars to the Mt. Vernon Car Mfg. Co., 250 cattle cars to the Ralston Steel Car Co. and 25 all-steel express cars to Bethlehem Steel Co. About 27,000 tons of steel will be required.

The New York Central has ordered 20 diesel-electric locomotives from Electro-Motive Corp. and nine from American Locomotive Co.

The Board of Transportation, New York, has ordered four flat cars and two money-collecting cars from the St. Louis Car Co. and one crane car from the Magor Car Corp.

Nevada Consolidated Copper Corp. has ordered 30 dump cars from the Austin-Western Road Machinery Co.

Illinois Central will build 100 flat cars in its own shops at Memphis, Tenn. Some parts from dismantled cars will be used.

Chesapeake & Ohio is understood to have purchased some material recently for at least a part of a car repair program that will involve about 800 cars.

REINFORCING BARS

. . . 4800 tons awarded for housing projects in Queens, N. Y.

THE largest award of the week was 4800 tons for the Queensbridge housing project in Queens, N. Y., which was divided equally between the Seaboard Steel Products Co. and the Fireproof Products Co., both of New York.

Activity on the Pacific Coast is fairly brisk. Several new projects are in sight there.

Concessions of $7 to $10 a ton are still common in the NEW YORK area, though mills alsewhere in the country report that prices being realized are higher than they were a month ago.

(Details of reinforcing bar awards and inquiries will be found on page 87.)

WIRE PRODUCTS

. . . October volume improved

. . . Automotive demand a factor

WIRE specifications at PITTSBURGH in October were slightly ahead of the September volume. Orders in the past week reflect greater activity in manufacturers' wire due largely to automotive demand. Merchant wire business is about holding its own, although jobber stocks continue exceptionally low. Lower farm purchasing power has been a retarding factor in merchant wire demand.

At CLEVELAND, producers confidently expect that the gain shown in October orders over the previous month will be held during November. The price situation on merchant products is reported to be better.

CHICAGO wire sales offices report that stronger demand for manufacturers' wire has materialized in the past week. Automobile makers are credited with most of the improvement. Merchant products are said to be moving in slightly better volume also.

Price concessions on nails have not entirely disappeared, although some mills have withdrawn low quotations.

COLD FINISHED BARS

. . . Automotive requirements add to incoming specifications

COLD finished bar specifications have increased some in the past few weeks due almost entirely to automotive requirements. Some jobber buying has appeared but tonnages involved are small and active support from many other consuming lines is lacking.

TUBULAR GOODS

. . . Oil country buying is not showing an increase

EXPECTED business from the mid-Continent oil fields has not materialized, it is reported from ST. LOUIS, where it is now believed there will be little buying before the early part of next year. Tubular sales as a whole at PITTSBURGH have shown no improvement in the past week, though mechanical tubing and standard pipe are slightly more active. The demand there for oil country pipe is off slightly. In the YOUNGSTOWN and CLEVELAND districts October sales were a little better than those of September, standard pipe and oil country goods for the Illinois field accounting for the improvement.

MERCHANT BARS

. . . Demand slowly expanding

. . . Automotive requirements a factor

DEMAND for bars in the CHICAGO district last week showed the expansion that had been anticipated following clarification of the general price structure. Orders from the automobile makers are the important feature in the improvement, although some measure of the upturn also is attributable to the tractor manufacturers. Releases from implement manufacturers still are light, but better

demand from this source is looked for soon.

Hot rolled bar bookings at PITTSBURGH increased somewhat during October. The improvement is, to a large extent, traceable to automotive demand. Fairly diversified miscellaneous requirements are still present, however, and total bookings in the past week were greater than the previous week. Consumer stocks remain relatively low but current business continues on a hand-to-mouth basis.

Incoming orders are well diversified at CLEVELAND and YOUNGSTOWN. Producers there expect a good rate of activity during November.

TIN PLATE

. . . Orders and production low as buyers await price announcement

TIN plate operations continue to fluctuate around 30 per cent with all buyers on the sidelines awaiting the expected price announcement. When this situation is clarified, a substantial flow of orders to the mills is anticipated as consumer stocks are exceptionally low. There are, however, substantial stocks in steel mill warehouses awaiting release by can manufacturers.

BOLTS, NUTS, RIVETS

. . . Upward trends in orders noted at Cleveland

FOR some producers in the CLEVELAND area, October was the peak month of the year from the standpoint of orders received, due to automotive buying and jobbers' requirements. Furthermore, it is the opinion of some sellers that the crest of the buying movement is still in the future.

Bids for approximately 112 tons of medium bar rivet steel to be used in constructing the destroyer tender *Fulton* at Mare Island (Cal.) Navy Yard, will be taken Nov. 4.

REINFORCING STEEL

. . . Awards of 9925 tons; 4200 tons in new projects.

NORTH ATLANTIC STATES
AWARDS

4800 Tons, Queens, N. Y., Queensbridge housing project, divided equally between Seaboard Steel Products Co. and Fireproof Products Co., both of New York, through Corbetta Construction Co., New York.

505 Tons, New York, North Beach airport, through Procurement Division of Treasury Department, to Igoe Bros., Newark, N. J.

500 Tons, Woodbridge, N. J., grade crossing elimination, to Bethlehem Steel Co., Bethlehem, Pa., through James Stewart & Co., New York.

490 Tons, White Hill, Pa., Industrial school for boys, to Sweets Steel Co., Williamsport, Pa., through John McShain, Inc., Philadelphia, contractor.

225 Tons, Washington, municipal court building, to American Steel Engineering Co., Philadelphia.

175 Tons, Boston, Navy Yard, building No. 131, to Bethlehem Steel Co., Bethlehem, Pa.

154 Tons, Scarboro, Me., highway projects 118A and 118B, to Bethlehem Steel Co., through Bancroft & Martin Lane Construction Co., contractor.

100 Tons, New Britain, Conn., Walnut Hill Trade School, to Bethlehem Steel Co., Bethlehem, Pa., through Topper & Griggs; Fusco & Amatruda, New Haven, contractors.

CENTRAL AND WESTERN STATES

600 Tons, Fort Lewis, Wash., barracks, to Western Steel Erecting Co., Los Angeles, through George A. Fuller Co., Los Angeles, contractor.

500 Tons, Los Angeles, wharf for harbor commissioners, to Soule Steel Co., Los Angeles, through Ben C. Gerwick, San Francisco, contractor.

450 Tons, Conchas Dam, N. M., tunnel, to Sheffield Steel Co., Kansas City, through McCarthy Improvement Co., Davenport, Iowa.

380 Tons, Ypsilanti, Mich., hospital and power plant addition, to Joseph T. Ryerson & Son, Inc., Chicago, through United Fireproofing Co., Chicago, contractor.

280 Tons, Detroit, MacKenzie High School, to Youngstown Sheet & Tube Co., Youngstown, through McRae Steel Co., Detroit.

225 Tons, Kalamazoo, Mich., Norge Co. building, to Calumet Steel Co., Chicago.

174 Tons, Corbett, Wyo., Shoshone project (Invitation 48151-A), to Sheffield Steel Co., Kansas City.

137 Tons, Calexico, Cal., All-American Canal project (Invitation B-42155-A), to Columbia Steel Co., San Francisco.

130 Tons, Detroit, Montgomery Ward building, to Concrete Steel Fireproofing Co., Detroit, through O. W. Burke Co., Detroit, contractor.

100 Tons, Detroit, grade separation, Lantz Avenue and Grand Trunk Western Railroad, to Bethlehem Steel Co., Bethlehem, Pa., through Jutton-Kelly Co., contractors.

NEW REINFORCING BAR PROJECTS
NORTH ATLANTIC STATES

518 Tons, Providence, R. I., parcel post building, George Fuller Construction Co., Boston, low bidder on general contract.

400 Tons, Washington, South End Key bridge.

400 Tons, Wayne County, N. Y., mostly mesh, highway project R.C. 8005; bids close Nov. 15.

282 Tons, Sullivan County, N. Y., mostly mesh, highway project R.C. 4002, Thomas A. Brogan, Yonkers, N. Y., low bidder on general contract.

250 Tons, Harrisburg, Pa., first section, Pittsburgh-Harrisburg turnpike, L. M. Hutchinson, Mount Union, Pa., general contractor.

180 Tons, Rockland County, N. Y., mostly mesh, highway project, R.C. 4005; bids close Nov. 15.

100 Tons, Buffalo, building for Canisius College; bids close Nov. 4.

CENTRAL AND WESTERN STATES

450 Tons, Decatur, Ill., county building.

409 Tons, San Francisco, George Washington High School athletic plant.

300 Tons, State of Oklahoma, Grand River Dam authority.

231 Tons, Lawrenceburg, Ind., bridge.

190 Tons, Detroit, Boys Club.

140 Tons, Modesto, Cal., Hall of Records; Truitt-Shields & Fisher low bidder on general contract.

120 Tons, Fresno, Cal., grandstand; Truitt-Shields & Fisher low bidders on general contract.

115 Tons, Highwood, Ill., water filtration plant.

110 Tons, Detroit, Davison Avenue grade separation at Grand Trunk Railroad.

Weekly Bookings of Construction Steel

	Week Ended				Year to Date	
	Nov. 1, 1938	Oct. 26, 1938	Oct. 4, 1938	Nov. 2, 1937	1938	1937
Fabricated structural steel awards	18,400	33,350	35,425	12,000	746,220	922,585
Fabricated plate awards	710	2,080	1,150	2,515	114,220	110,045
Steel sheet piling awards	0	800	1,300	185	37,865	37,580
Reinforcing bar awards	9,925	8,200	9,000	6,375	282,090	240,040
Total Letting of Construction Steel..	29,035	44,430	46,875	21,075	1,180,395	1,310,250

IRON AND STEEL SCRAP

. . . Chicago and Youngstown prices jump on basis of sales to mills . . . Composite up 25c. to $14.42.

NOV. 1.—A Chicago district mill bought an unstated tonnage of No. 1 heavy melting steel at $14, making the quoted range $13.50 to $14, or up an average of 75c. over the flat price of $13 prevailing the week before. Many other grades have moved up 50c. in sympathy with this bullish news. Recent large purchases in the Valley have raised No. 1 steel $1 there and other grades 50c. There is no change in No. 1 steel at Cleveland, following a rise of $1 on the basis of similar mill sales last week, but other grades than blast furnace material were noticeably stronger this week. The market at St. Louis is stronger and most items are up 25 to 50c. At Detroit, cast iron items are showing strength as automotive foundries go into production. Prices at New York and Philadelphia are unchanged, however, and the quotation on No. 1 steel at Pittsburgh is unchanged, with very little material changing hands. On the basis of the boost in Chicago prices, the composite price of No. 1 steel is up 25c. to $14.42, equal to the level prevailing on Sept. 13 and signalling perhaps the end of the slight dip in prices that had occurred since then.

New Japanese buying is reported at a price equivalent to $15.50 for No. 1 steel on shipboard.

Pittsburgh

The market undertone has gained some strength owing to a flurry of sales in other districts, but No. 1 heavy melting steel quotations are unchanged this week at $14.50 to $15. A small tonnage of No. 1 steel was sold into consumption last week at $14.50 a ton, but most brokers were either covered on the material or had tentative commitments. For the time being, buying and selling appears to be balanced, but in view of the small tonnages the market would probably be highly sensitive to substantial requirements.

Chicago

A Chicago district mill has bought an undisclosed tonnage of No. 1 heavy melting steel at $14. Thus, the quotation is raised to $13.50 to $14 from the level of a flat $13. The sharp increase in ingot production is stimulating considerable encouragement throughout the trade.

Philadelphia

There has been no change in the dull market conditions which have prevailed for some time in eastern Pennsylvania. Mill purchases of steel making grades are negligible and foundry buying is slow to develop despite recent gains in casting operations. Continued broker buying for export on the basis of $14 for No. 1 steel and $13 for No. 2 is the chief support of present price level. In view of this export business and the low level of dealers' stocks at present it is unlikely that less than $14.50 could be offered on No. 1 steel for domestic consumption. Recent export orders include 40,000 tons of Hungary at $14.50 for No. 1 steel.

Cleveland

For the first time since last August, the local market on open-hearth grades has been definitely established on the basis of mill buying. Reflection of the unquestionably stronger state of the market is found in the more valuable grades, with blast furnace materials for the present unchanged. As reported last week, No. 1 heavy melting is now quoted at $13.50 to $14 per ton and No. 2 at $12.50 to $13.

Youngstown

Recent large sales to steel producers in the Valley have established No. 1 heavy melting at $14.50 to $15 per ton; No. 2, $13.50 to $14; and other quoted grades slightly higher than heretofore. Scrap is moving into mill centers freely and the whole market has a much firmer tone than at any time this year.

Buffalo

The feature of the market last week was the sale to a large mill in the area of approximately 8000 tons of No. 2 heavy melting steel, at quoted prices. At the same time there have been some small sales of cast scrap. Machine-shop turnings advanced to $8.00-8.50 and shoveling turnings go to $8.75-9.25. Dealers feel that future sales of the heavier lines will be at higher prices.

St. Louis

The scrap iron market at St. Louis is stronger, and most items are higher than a week ago. The strength is due to a stronger demand elsewhere, a tightening of shipments from country dealers, and "fishing around" of several mills in the district. Advances of 25c. a ton were made on No. 1 locomotive tires, machine shop turnings, cast iron car wheels and brake shoes. Selected heavy melting, Nos. 1 and 2 heavy melting, steel angle bars, advanced 50c. Railroad springs, and No. 2 wrought advanced $1. Railroad lists include: Pennsylvania, 8990 tons; Wabash, 3594 tons; Ann Arbor, 604 tons; Gulf Coast lines, and New York, Cleveland & Chicago, 2263, which likely will go to other markets.

Cincinnati

A little activity in gray iron scrap strengthened prices on these items a bit, but did not move the list upward. Steel items are without much interest, although dealer sentiment is still toward early improvement in mill demand. Yard supplies are in good shape and dealers refuse to take material for the yards except from regular suppliers, so as to avoid too heavy inventories.

Detroit

For the first time this year cast iron scrap shows a bit of strength and forward movement. With production foundries operating steadily to supply the automobile industry, recent sales of all grades of cast scrap have been at prices about 50c. a ton higher than the previous prevailing level. Automotive lists which closed during the last week and early this week showed minor variations from published prices with increased strength being shown by some items.

Boston

A round tonnage of boiler tubes has left here for London; a steamer is loading at Providence and will finish up here at the Army base; a steamer is loading at Portland, Me., and will finish here at Mystic Wharf; a steamer is expected to start loading at Providence late this week; and a steamer is expected to start loading here at about the same time. Thus the export market is quite active and there being no surplus of scrap, prices are very firm, although not actually higher. However, exporters intimate they would pay a 25c. a ton premium for a round tonnage of No. 1 steel. The domestic market is quite inactive and prices nominal.

New York

As has been expected, the Japanese have come into the market for another round tonnage, estimated to be close to the 100,000 tons placed in September. Price paid is said to be $15.50 on the boat for No. 1 steel and other grades proportionally. Dealers' buying prices both for export and for domestic shipment are unchanged from last week. Material is said to be coming out more freely and there no longer appears to be a shortage of stove plate. It is interesting to note that some of the miscellaneous steel and cast iron items involved in the demolition of the old post building in downtown New York are being bought for export. Heavy cast material is going to an eastern Pennsylvania mill, however, and the structural members to a rerolling mill in New Jersey.

. . . CANADA . . .

. . . Munitions inquiry halts placing of new contracts.

TORONTO, Nov. 1.—While Canadian steel interests report good volume of backlogs and anticipate large additional contracts before the close of the year, actual booking is slow at this time. The Bren gun inquiry now under way, with criticism directed toward the Government for placing the order with the John Inglis Co., appears to be responsible for the lack of awards of other contracts by the British Government. However, large orders for war materials are overhanging the market and are expected to be placed soon.

Iron and Steel Scrap Prices

PITTSBURGH

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
Railroad hvy. mltng..	15.75 to 16.25
No. 2 hvy. mltng. steel	13.50 to 14.00
Scrap rails	16.00 to 16.50
Rails 3 ft. and under..	17.00 to 17.50
Comp. sheet steel	14.50 to 15.00
Hand bundled sheets..	13.50 to 14.00
Hvy. steel axle turn..	13.50 to 14.00
Machine shop turn....	9.75 to 10.25
Short shov. turn.....	9.75 to 10.25
Mixed bor. & turn....	8.25 to 8.75
Cast iron borings.....	8.25 to 8.75
Cast iron carwheels...	14.50 to 15.00
Hvy. breakable cast...	12.50 to 13.00
No. 1 cupola cast.....	15.25 to 15.75
RR. knuckles & cplrs.	16.50 to 17.00
Rail coil & leaf springs	16.50 to 17.00
Rolled steel wheels...	16.50 to 17.00
Low phos. billet crops.	17.50 to 18.00
Low phos. punchings.	16.50 to 17.00
Low phos. plate	16.50 to 17.00

PHILADELPHIA

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	13.00 to 13.50
Hydraulic bund., new.	14.50 to 15.00
Hydraulic bund., old..	11.50 to 12.00
Steel rails for rolling.	17.00 to 17.50
Cast iron carwheels...	16.50 to 17.00
Hvy. breakable cast..	16.00 to 16.50
No. 1 cast	16.50 to 17.00
Stove plate (steel wks.)	13.00 to 13.50
Railroad malleable ...	15.50 to 16.00
Machine shop turn....	8.00 to 8.50
No. 1 blast furnace....	6.50 to 7.00
Cast borings	6.50 to 7.00
Heavy axle turnings..	10.00 to 10.50
No. 1 low phos. hvy...	16.50 to 17.00
Couplers & knuckles..	16.50 to 17.00
Rolled steel wheels ...	16.50 to 17.00
Steel axles	21.50 to 22.00
Shafting	19.50 to 20.00
No. 1 RR. wrought....	15.00 to 15.50
Spec. iron & steel pipe	12.00 to 12.50
No. 1 forge fire	11.00 to 11.50
Cast borings (chem.)..	9.50 to 10.00

CHICAGO

Delivered to Chicago district consumers:

	Per Gross Ton
Hvy. mltng. steel	$13.50 to $14.00
Auto. hvy. mltng. steel alloy free	$11.00 to 11.50
No. 2 auto. steel.....	11.00 to 11.50
Shoveling steel	13.00 to 13.50
Factory bundles	12.00 to 12.50
Dealers' bundles	11.50 to 12.00
Drop forge flashings...	11.00 to 11.50
No. 1 busheling	12.00 to 12.50
No. 2 busheling, old...	4.25 to 4.75
Rolled carwheels	15.00 to 15.50
Railroad tires, cut....	15.50 to 16.00
Railroad leaf springs..	15.50 to 16.00
Steel coup & knuckles	14.00 to 14.50
Axle turnings	12.00 to 12.50
Coil springs	16.50 to 17.00
Axle turn. (elec.)	12.00 to 12.50
Low phos. punchings..	15.50 to 16.00
Low phos. plates 12 in. and under	15.50 to 16.00
Cast iron borings	5.50 to 6.00
Short shov. turn.	6.50 to 7.00
Machine shop turn....	6.00 to 6.50
Rerolling rails	17.00 to 17.50
Steel rails under 3 ft..	16.00 to 16.50
Steel rails under 2 ft..	16.50 to 17.00
Angle bars, steel	15.00 to 15.50
Cast iron carwheels...	13.50 to 14.00
Railroad malleable	14.50 to 15.00
Agric. malleable	10.50 to 11.00
	Per Net Ton
Iron car axles	18.00 to 18.50
Steel car axles	18.50 to 19.00
Locomotive tires	15.50 to 16.00
Pipes and flues	9.00 to 9.50
No. 1 machinery cast.	12.00 to 12.50
Clean auto. cast.	12.00 to 12.50
No. 1 railroad cast....	11.00 to 11.50
No. 1 agric. cast.....	10.50 to 11.00
Stove plate	8.50 to 9.00
Grate bars	8.50 to 9.00
Brake shoes	9.50 to 10.00

YOUNGSTOWN

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.50 to $15.00
No. 2 hvy. mltng. steel.	13.50 to 14.00
Low phos. plate	15.50 to 16.00
No. 1 busheling	13.50 to 14.00
Hydraulic bundles	14.00 to 14.50
Machine shop turn....	10.00 to 10.50

CLEVELAND

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$13.50 to $14.00
No. 2 hvy. mltng. steel.	12.50 to 13.00
Comp. sheet steel	12.50 to 13.00
Light bund. stampings	9.50 to 10.00
Drop forge flashings..	11.50 to 12.00
Machine shop turn....	7.00 to 7.50
Short shov. turn.....	7.50 to 8.00
No. 1 busheling	11.50 to 12.00
Steel axle turnings....	10.00 to 10.50
Low phos. billet and bloom crops	17.50 to 18.00
Cast iron borings	7.75 to 8.25
Mixed bor. & turn....	7.75 to 8.25
No. 2 busheling	7.75 to 8.25
No. 1 cast	16.50 to 17.00
Railroad grate bars ..	9.50 to 10.00
Stove plate	10.00 to 10.50
Rails under 3 ft.	19.00 to 19.50
Rails for rolling	17.00 to 17.50
Railroad malleable ...	15.00 to 15.50
Cast iron carwheels ..	14.00 to 14.50

BUFFALO

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$14.00 to $14.50
No. 2 hvy. mltng. steel.	12.00 to 12.50
Scrap rails	15.00 to 15.50
New hvy. bndled sheets	12.00 to 12.50
Old hydraul. bundles.	10.50 to 11.00
Drop forge flashings..	12.00 to 12.50
No. 1 busheling	12.00 to 12.50
Hvy. axle turnings....	10.50 to 11.00
Machine shop turn....	8.00 to 8.50
Knuckles & couplers..	16.50 to 17.00
Coil & leaf springs....	16.50 to 17.00
Rolled steel wheels....	16.00 to 16.50
Low phos. billet crops.	15.50 to 16.00
Shov. turnings	8.75 to 9.25
Mixed bor. & turn....	8.00 to 8.50
Cast iron borings.....	8.00 to 8.50
Steel car axles	16.50 to 17.00
No. 1 machinery cast.	15.50 to 16.00
No. 1 cupola cast.	14.50 to 15.00
Stove plate	13.00 to 13.50
Steel rails under 3 ft..	17.50 to 18.00
Cast iron carwheels...	13.50 to 14.00
Railroad malleable ...	14.50 to 15.00
Chemical borings	8.50 to 9.00

ST. LOUIS

Dealers' buying prices per gross ton delivered to consumer:

Selected hvy. melting.	$13.00 to $13.50
No. 1 hvy. melting....	13.00 to 13.50
No. 2 hvy. melting....	12.00 to 12.50
No. 1 locomotive tires.	13.25 to 13.75
Misc. stand. sec. rails.	12.75 to 13.25
Railroad springs	15.00 to 16.00
Bundled sheets	8.00 to 8.50
No. 1 busheling	7.50 to 8.00
Cast. bor. & turn.....	3.50 to 4.00
Machine shop turn....	4.25 to 4.75
Heavy turnings	9.00 to 9.50
Rails for rolling	16.50 to 17.00
Steel car axles	17.50 to 18.00
No. 1 RR. wrought....	10.75 to 11.25
No. 2 RR. wrought....	13.00 to 13.50
Steel rails under 3 ft..	15.50 to 16.00
Steel angle bars	14.00 to 14.50
Cast iron carwheels...	14.00 to 14.50
No. 1 machinery cast..	14.25 to 14.75
Railroad malleable	12.00 to 12.50
No. 1 railroad cast....	11.00 to 11.50
Stove plate	9.00 to 9.50
Grate bars	8.50 to 9.00
Brake shoes	10.00 to 10.50

CINCINNATI

Dealers' buying prices per gross ton at yards:

No. 1 hvy. mltng. steel.	$11.00 to $11.50
No. 2 hvy. mltng. steel.	8.75 to 9.50
Scrap rails for mltng..	15.00 to 15.50
Loose sheet clippings.	6.50 to 7.00
Hydrau. b'ndled sheets	10.00 to 10.50
Cast iron borings	4.00 to 4.50
Machine shop turn....	5.25 to 5.75
No. 1 busheling	7.75 to 8.25
No. 2 busheling	2.50 to 3.00
Rails for rolling	17.00 to 17.50
No. 1 locomotive tires.	13.75 to 14.25
Short rails	17.50 to 18.00
Cast iron carwheels...	12.25 to 12.75
No. 1 machinery cast.	13.00 to 13.50
No. 1 railroad cast....	12.75 to 13.25
Burnt cast	6.75 to 7.25
Stove plate	6.75 to 7.25
Agricul. malleable	11.25 to 11.75
Railroad malleable	13.75 to 14.25
Mixed hvy. cast.	10.25 to 10.75

BIRMINGHAM

Per gross ton delivered to consumer:

Hvy. melting steel....	$12.50 to $14.00
Scrap steel rails	14.50 to 15.00
Short shov. turnings..	7.50 to 8.10
Stove plate	9.00 to 10.00
Steel axles	15.00 to 16.00
Iron axles	15.00 to 16.00
No. 1 RR. wrought....	.... 10.00
Rails for rolling	16.00 to 16.50
No. 1 cast	.... 14.50
Tramcar wheels	.... 14.00

DETROIT

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.	$10.00 to $10.50
No. 2 hvy. mltng. steel.	8.50 to 9.00
Borings and turnings.	5.50 to 6.00
Long turnings	5.50 to 6.00
Short shov. turnings..	6.50 to 7.00
No. 1 machinery cast..	12.00 to 12.50
Automotive cast	13.00 to 13.50
Hvy. breakable cast...	9.50 to 10.00
Hydraul. comp. sheets.	11.75 to 12.25
Stove plate	8.00 to 8.50
New factory bushel...	10.75 to 11.25
Old No. 2 busheling..	3.00 to 3.50
Sheet clippings	9.00 to 9.50
Flashings	9.00 to 9.50
Low phos. plate scrap	11.75 to 12.25

NEW YORK

Dealers' buying prices per gross ton on cars:

No. 1 hvy. mltng. steel.	$10.00 to $10.50
No. 2 hvy. mltng. steel	8.50 to 9.00
Hvy. breakable cast...	12.00 to 12.50
No. 1 machinery cast.	11.50 to 12.00
No. 2 cast	9.50 to 10.00
Stove plate	9.00 to 9.50
Steel car axles	20.00 to 20.50
Shafting	15.00 to 15.50
No. 1 RR. wrought....	11.00 to 11.50
No. 1 wrought long....	9.50 to 10.00
Spec. iron & steel pipe	8.50 to 9.00
Rails for rolling	16.00 to 16.50
Clean steel turnings*...	3.50 to 4.00
Cast borings*	3.00 to 3.50
No. 1 blast furnace...	3.00 to 3.50
Cast borings (chem.)..	9.50 to 10.00
Unprepared yard scrap	5.00 to 5.50
Light iron	3.00 to 3.50

Per gross ton, delivered local foundries:

No. 1 machn. cast†....	$13.50 to $14.00
No. 2 cast†	10.50 to 11.00

* $1.50 less for truck loads.
† Northern N. J. prices are $2 to $2.50 higher.

BOSTON

Dealers' buying prices per gross ton:

No. 1 hvy. mltng. steel.....	Nominal
Scrap rails	Nominal
No. 2 steel	Nominal
Breakable cast	10.50
Machine shop turn.....	3.38
Mixed bor. & turn.....	2.00 to 2.25
Bun. skeleton long....	7.25
Shafting	10.25 to 10.50
Cast bor. chemical....	5.50 to 5.75

Per gross ton delivered consumers' yards:

Textile cast	$12.50 to $14.50
No. 1 machine cast....	12.50 to 14.50

PACIFIC COAST

Per gross ton delivered to consumer:

No. 1 hvy. mltng. steel.	$12.50 to $14.00
No. 2 hvy. mltng. steel.	11.50 to 13.00

CANADA

Dealers' buying prices at their yards, per gross ton:

	Toronto	Montreal
No. 1 hvy. mltng. steel.	$9.50	$9.00
No. 2 hvy. mltng. steel.	8.00	7.50
Mixed dealers steel...	7.00	6.50
Scrap pipe	5.50	5.00
Steel turnings	4.50	4.00
Cast borings	3.50	3.00
Machinery cast	15.00	14.00
Dealers cast	13.00	12.00
Stove plate	11.00	10.50

EXPORT

Dealers' buying prices per gross ton:

New York, truck lots, delivered, barges

No. 1 hvy. mltng. steel.	$11.50*
No. 2 hvy. mltng. steel.	10.00
No. 2 cast	11.00
Stove plate	10.00 to 10.50

Boston on cars at Army Base or Mystic Wharf

No. 1 hvy. mltng. steel.	$13.25 to $13.50
No. 2 hvy. mltng. steel.	12.25 to 12.50
Rails (scrap)	13.25 to 13.50

Philadiphia, delivered alongside boats, Port Richmond

No. 1 hvy. mltng. steel.....	$14.00
No. 2 hvy. mltng. steel.....	13.00

PRICES ON FINISHED AND SEMI-FINISHED IRON AND STEEL

SEMI-FINISHED STEEL

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (Rerolling only). Prices delivered Detroit are $2 higher. F.o.b. Duluth, billets only, $2 higher.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point, Md.

	Per Gross Ton
Open-hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb.
Grooved, universal and sheared	1.90c.

Wire Rods

(No. 5 to 9/32 in.)

	Per Gross Ton
Pittsburgh, Chicago or Cleveland	$43.00
Worcester, Mass.	45.00
Birmingham	43.00
San Francisco	52.00

Rods over 9/32 in. or 47/64 in., inclusive, $5 a ton over base.

SOFT STEEL BARS

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Buffalo and Birmingham	2.25c.
Detroit, delivered	2.35c.
Duluth	2.35c.
Philadelphia delivered	2.57c.
New York	2.59c.
On cars dock Gulf ports	2.60c.
On cars dock Pacific ports	2.85c.

RAIL STEEL BARS

(For merchant trade)

Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham	2.10c.
On cars dock Tex. Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

BILLET STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Cleveland, Youngstown or Sparrows Pt.	1.90c. to 2.05c.
Detroit, delivered	2.00c. to 2.15c.
On cars dock Tex. Gulf ports	2.25c. to 2.40c.
On cars dock Pacific ports	2.50c.

RAIL STEEL REINFORCING BARS

(Straight lengths as quoted by distributers)

Pittsburgh, Chicago, Gary, Buffalo, Cleveland, Youngstown or Birmingham	1.75c. to 1.90c.
Detroit, delivered	1.85c. to 2.00c.
On cars dock Tex. Gulf ports	2.10c. to 2.25c.
On cars dock Pacific ports	2.35c.

Prices on reinforcing bars have been subject to concessions of $3 a ton or more from above quotations.

IRON BARS

Chicago and Terre Haute	2.15c.
Pittsburgh (refined)	3.60c.

COLD FINISHED BARS AND SHAFTING*

	Base per Lb.
Pittsburgh, Buffalo, Cleveland, Chicago and Gary	2.70c.
Detroit	2.75c.

* In quantities of 10,000 to 19,999 lb.

PLATES

	Base per Lb.
Pittsburgh, Chicago, Gary, Birmingham, Sparrows Point, Cleveland, Youngstown, Coatesville, Claymont, Del.	2.10c.
*Philadelphia, del'd	2.15c.
*New York, del'd	2.29c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.60c.
Wrought iron plates, P't'g	3.80c.

*Eastern prices subject to occasional concessions of $2 a ton.

FLOOR PLATES

Pittsburgh or Chicago	3.35c.
New York, del'd	3.71c.
On cars dock Gulf ports	3.70c.
On cars dock Pacific ports	3.95c.

STRUCTURAL SHAPES

	Base per Lb.
Pittsburgh, Chicago, Gary, Buffalo, Bethlehem or Birmingham	2.10c.
Philadelphia, del'd	2.215c.
New York, del'd	2.27c.
On cars dock Gulf ports	2.45c.
On cars dock Pacific ports	2.70c.

STEEL SHEET PILING

	Base per Lb.
Pittsburgh, Chicago or Buffalo	2.40c.
On cars dock Gulf ports	2.85c.
On cars dock Pacific ports	2.90c.

RAILS AND TRACK SUPPLIES

F.o.b. Mill

Standard rails, heavier than 60 lb., per gross ton	$40.00
Angle bars, per 100 lb	2.70

F.o.b. Basing Points

Light rails (from billets) per gross ton	$40.00
Light rails (from rail steel) per gross ton	39.00

	Base per Lb.
Cut spikes	3.00c.
Screw spikes	4.55c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast ports	2.25c.
Track bolts, to steam railroads	4.15c.
Track bolts to jobbers, all sizes (per 100 counts)	65-5

Basing points on light rails Pittsburgh, Chicago and Birmingham; on spikes and tie plates, Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; on tie plates alone, Steelton, Pa., Buffalo; on spikes alone, Youngstown, Lebanon, Pa., Richmond, Va.

SHEETS**

PRICES F.O.B. UNLESS OTHERWISE NOTED

Hot Rolled

	Base per Lb.
Pittsburgh, Gary, Birmingham, Buffalo, Sparrows Point, Cleveland, Youngstown, Middletown or Chicago	.15c.
Detroit, delivered	2.25c.
Philadelphia, delivered	2.32c.
Granite City	2.25c.
On cars dock Pacific ports	2.65c.
Wrought iron, Pittsburgh	4.25c.

Cold Rolled*

Pittsburgh, Gary, Buffalo, Youngstown, Cleveland, Middletown or Chicago	3.20c.
Detroit, delivered	3.30c.
Granite City	3.30c.
Philadelphia, delivered	3.52c.
On cars dock Pacific ports	3.80c.

* Mill run sheets are 10c. per 100 lb. less than base; and primes only, 25c. above base.

** The above are generally actual going prices, subject to change without notice and are $6 a ton below published prices announced recently for fourth quarter delivery.

Galvanized Sheets, 24 Gage

Pittsburgh, Chicago, Gary, Sparrows Point, Buffalo, Middletown, Youngstown or Birmingham	3.50c.
Philadelphia, delv'd	3.67c.
Granite City	3.60c.
On cars dock Pacific ports	4.00c.
Wrought iron Pittsburgh	6.10c.

Electrical Sheets

(*F.o.b. Pittsburgh*)

	Base per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Special Motor	4.95c.
Special Dynamo	5.65c.
Transformer	6.15c.
Transformer Special	7.15c.
Transformer Extra Special	7.65c.

Silicon Strip in coils—Sheet price plus silicon sheet extra width extra plus 25c. per 100 lb. for coils. Pacific ports add 70c. a 100 lb.

Long Ternes

No. 24 unassorted 8-lb. coating f.o.b. Pittsburgh or Gary	3.95c.
F.o.b. cars dock Pacific ports	4.65c.

Vitreous Enameling Stock, 20 Gage*

Pittsburgh, Chicago, Gary, Youngstown, Middletown or Cleveland	3.35c.
Detroit, delv'd	3.15c.
Granite City	3.45c.
On cars dock Pacific ports	3.95c.

TIN MILL PRODUCTS

Black Plate

Pittsburgh, Chicago and Gary	3.15c.
Granite City	3.25c.
On cars dock Pacific ports, boxed	4.10c.

NOTE: No. 29 gage is heaviest in which tin mill black plate is sold, No. 28 and heavier taking sheet base. There are no gages which take the above base prices as extras are applicable in all cases.

Tin Plate

	Per Base Box
Standard cokes, Pittsburgh, Chicago and Gary	$5.35
Standard cokes, Granite City	5.45

Special Coated Manufacturing Ternes

	Per Base Box
Pittsburgh	$4.65
Gary	4.65
Granite City	4.75

Roofing Terne Plate

(*F.o.b. Pittsburgh*)

(Per Package, 112 sheets, 20 x 28 in.)	
8-lb. coating I.C.	$12.00
15-lb. coating I.C.	14.00
20-lb. coating I.C.	15.00
25-lb. coating I.C.	16.00
30-lb. coating I.C.	17.25
40-lb. coating I.C.	19.50

HOT ROLLED STRIP

Prices F.o.b. Unless Otherwise Noted

(*Widths up to 12 in.*)

	Base per Lb.
Pittsburgh, Chicago, Gary, Cleveland, Middletown, Youngstown or Birmingham	2.15c.
Detroit, delivered	2.25c.

Cooperage Stock

Pittsburgh & Chicago	2.25c.

COLD ROLLED STRIP**

	Base per Lb.
Pittsburgh, Youngstown or Cleveland	3.10c.
Chicago	3.05c.
Detroit, delivered	3.05c.
Worcester	3.15c.

* Carbon 0.25 and less.

Commodity Cold Rolled Strip

Pittsburgh, Youngstown, or Cleveland	3.10c.
Detroit, delivered	3.20c.
Worcester	3.50c.

COLD ROLLED SPRING STEEL

		Pittsburgh and Cleveland	Worcester
Carbon	0.26-0.50%	2.95c.	3.15c.
Carbon	.51 .75	4.30c.	4.50c.
Carbon	.76-1.00	6.15c.	6.35c.
Carbon	1.01 to 1.25	8.35c.	8.55c.

WIRE PRODUCTS

(Carload lots, f.o.b. Pittsburgh, Chicago, Cleveland and Birmingham)

To Manufacturing Trade

	Per Lb.
Bright wire	2.60c.
Galvanized wire, base	2.65c.*
Spring wire	3.20c.

* On galvanized wire to manufacturing trade, size and galvanizing extras are charged, the price Nos. 6 to 9 gage, inclusive, thus being 3.15c.

To the Trade

	Base per Keg
Standard wire nails	$2.45
Coated nails	2.45
Cut nails, carloads	3.60

	Base per 100 Lb.
Annealed fence wire	$2.95
Galvanized fence wire	3.35
Polished staples	3.15
Galvanized staples	3.40
Barbed wire, galvanized	3.20
Twisted barbless wire	3.20
Woven wire fence, base column.	67
Single loop bale ties, base col...	56

Note: Birmingham base same on above items, except spring wire.

Add $4 a ton for Mobile, Ala.; $5 for New Orleans; $6 for Lake Charles to above bases, except on galvanized and annealed merchant fence wire, which are $1 a ton additional in ecah case.

STEEL AND WROUGHT IRON PIPE AND TUBING

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

F.o.b. Pittsburgh only on wrought iron pipe.

Butt Weld

Steel In.	Black	Galv.	*Wrought Iron* In.	Black	Galv.
⅛	56	36	¼ & ⅜	.+ 9	+30
¼ to ⅜	..59	43½	½	24	6½
½	....63½	54	¾	30	13
¾	....66½	58	1 & 1¼	..34	19
1 to 3	..68½	60½	1½	38	21½
			2	....37½	21

Lap Weld

2	61	52½	2	....30½	15
2½ & 3	..64	55½	2½ to 3½	31½	17½
3½ to 6	..66	57½	4	....33½	21
7 & 8	..65	55½	4½ to 8.32	½	20
9 & 10	..64½	55	9 to 12	..28½	15
11 & 12	..63½	54			

Butt weld, extra strong, plain ends

⅛	....54½	41½	¼ & ⅜	.+10	+43
½ to ⅜	..56½	45½	½	25	9
½	....61½	53½	¾	31	15
¾	....65½	57½	1 to 2	...38	22½
1 to 3	...67	60			

Lap weld, extra strong, plain ends

2	59	51½	2	....33½	18½
2½ &	63	55½	2½ to 4.39		25½
3½ to 6	..66½	59	4½ to 6.37	½	24
7 & 8	..65½	56	7 & 8	..38½	24½
9 & 10	..64½	55	9 to 12	..32	20½
11 & 12	..63½	54			

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher, on all butt weld 3 in. and smaller.

Boiler Tubes

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes. Minimum Wall.

(Net base prices per 100 ft. f.o.b. Pittsburgh in carload lots)

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld Hot Rolled
1 in. o.d....13 B.W.G.	$ 9.01	$ 7.82	....
1¼ in. o.d...13 B.W.G.	10.67	9.26	....
1½ in. o.d...13 B.W.G.	11.79	10.23	$9.72
1⅝ in. o.d...13 B.W.G.	13.42	11.64	11.06
2 in. o.d....13 B.W.G.	15.03	13.04	12.38
2¼ in. o.d...13 B.W.G.	16.76	14.54	13.79
2¼ in. o.d...12 B.W.G.	18.45	16.01	15.16
2½ in. o.d...12 B.W.G.	20.21	17.54	16.58
2¾ in. o.d...12 B.W.G.	21.42	18.59	17.54
3 in. o.d....12 B.W.G.	22.48	19.50	18.35
3½ in. o.d...11 B.W.G.	28.37	24.62	23.15
4 in. o.d....10 B.W.G.	35.20	30.54	28 66
4½ in. o.d...10 B.W.G.	43.04	37.35	35.22
5 in. o.d.... 9 B.W.G.	54 01	46.87	44.25
6 in. o.d.... 7 B.W.G.	82.93	71.96	68.14

Extras for less carload quantities:

40,000 lb. or ft. or over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

CAST IRON WATER PIPE

	Pet Net Ton
*6-in. and larger, del'd Chicago.	$51.00
6-in. and larger, del'd New York	49.00
*6-in. and larger, Birmingham.	43.00
6-in. and larger, f.o.b. dock, San Francisco or Los Angeles....	52.00
F.o.b. dock, Seattle	52.00
4-in. f.o.b. dock, San Francisco or Los Angeles	55.00
F.o.b. dock, Seattle	52.00

Class "A" and gas pipe, $3 extra 4-in. pipe is $3 a ton above 6-in.

Prices for lots of less than 200 tons. For 200 tons and over, 6-in. and larger is $42, Birmingham, and $50 delivered Chicago and 4-in. pipe, $45, Birmingham, and $54 delivered Chicago.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
Machine and carriage bolts: ½ in. & 6 in. and smaller	65, 5 and 5*
Larger and longer up to 1 in.	60, 10 and 5*
1⅛ in. and larger	60, 5 and 5*
Lag bolts	60, 10 and 5
Plow bolts, Nos. 1, 2, 3 and 7	65, 5 and 5
Hot pressed nuts, and c.p.c. and t nuts, square or hex. blank or tapped: ½ in. and smaller	65 and 5
9/16 in. to 1 in. inclusive.	60, 5 and 5
1⅛ in. and larger	60 and 5

* Less carload lots and less than full container quantity. Less carload lots in full container quantity, an additional 10 per cent discount; carload lots and full container quantity, still another 5 per cent discount.

	U.S.S.	S.A.E.
Semi-fin. hexagon nuts		
¼ to 7/16 in. incl.	65-10	70-5
½ to 9/16 in.	65-5	70
⅝ to 1-in. incl.	60-10	65
1⅛ in. and larger	60-5	60-5

Beyond the above, an additional 10 per cent allowed for full container quantities.

Stove bolts in packages, nuts attached	75
Stove bolts in packages, with nuts separate	75 and 12½
Stove bolts in bulk	85

On stove bolts freight is allowed to destination on 200 lb. and over.

Large Rivets

(½-in. and larger)

Base per 100 Lb.

F.o.b. Pittsburgh, Cleveland Chicago, Birmingham $3.40

Small Rivets

(7/16-in. and smaller)

Per Cent Off List

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham .... 65 and 10

Cap and Set Screws

(Freight allowed to destination)

Per Cent Off List

Milled hexagon head, cap screws, 1 in. dia. and smaller	50 and 10
Milled square head set screws, case hardened, 1 in. dia. and smaller	75 and 10
Milled headless set screws, cut thread ¾ in. and smaller	70 and 10
Upset hex. head cap screws U.S.S. or S.A.E. thread 1 in. and smaller	67½ and 10
Upset set screws, cup and oval points	75 and 10
Milled studs	60½ and 10

Alloy and Stainless Steel

Alloy Steel Blooms, Billets and Slabs

F.o.b. Pittsburgh, Chicago, Canton, Massillon, Buffalo, Bethlehem. Base price, $56.00 a gross ton.

Alloy Steel Bars

F.o.b. Pittsburgh, Chicago, Buffalo, Bethlehem, Massillon or Canton.

Open-hearth grade, base	2.80c.
Delivered, Detroit	2.90c.

S.A.E. Series Numbers	Alloy Differential per 100 Lb.
2100 (1¼% Nickel)	$0.75
2300 (3½% Nickel)	1.55
2500 (5% Nickel)	2.25
3100 Nickel-chromium	0.70
3200 Nickel-chromium	1.85
3300 Nickel-chromium	3.80
3400 Nickel-chromium	3.20
4100 Chromium-molybdenum (0.15 to 0.25 Molybdenum)	0.55
4100 Chromium-molybdenum (0.25 to 0.40 Molybdenum)	0.75
4600 Nickel - molybdenum (0.20 to 0.30 Mo. 1.50 to 2.00 Ni.)	1.10
5100 Chrome steel (0.60-0.90 Cr.)	0.35
5100 Chrome steel (0.80-1.10 Cr.)	0.45
5100 Chromium spring steel	0.15
6100 Chromium-vanadium bar	1.20
6100 Chromium-vanadium spring steel	0.85
Chromium-nickel vanadium	1.50
Carbon-vanadium	0.85

These prices are for hot-rolled steel bars. The differential for most grades in electric furnace steel is 50c. higher. Slabs with a section area of 16 in. and 2½ in. thick or over take the billet base.

Alloy Cold-Finished Bars

F.o.b. Pittsburgh, Chicago, Gary, Cleveland or Buffalo, 3.40c. base per lb. Delivered Detroit, 3.50c., carlots.

CORROSION & HEAT RESISTANT ALLOYS

(Base prices, cents per lb., f.o.b. Pittsburgh)

Chrome-Nickel

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25c.	24c.
Plates	29c.	27c.
Structural shapes.	25c.	24c.
Sheets	36c.	34c.
Hot-rolled strip	23.50c.	21.50c.
Cold-rolled strip	30c.	28c.
Drawn wire	25c.	24c.

Straight Chrome

	No. 410	No. 430	No. 442	No. 446
Bars	18.50c.	19c.	22.50c.	27.50c.
Plates	21.50c.	22c.	25.50c.	30.50c.
Sheets	26.50c.	29c.	32.50c.	36.50c.
Hot strip	17c.	17.50c.	23c.	28c.
Cold stp.	22c.	22.50c.	28.50c.	36.50c.

TOOL STEEL

High speed	67c.
High-carbon-chrome	43c.
Oil-hardening	24c.
Special	22c.
Extra	18c.
Regular	14c.

Prices for warehouse distribution to all points on or East of Mississippi River are 2c. a lb. higher. West of Mississippi quotations are 3c. a lb. higher.

British and Continental

BRITISH

Per Gross Ton f.o.b. United Kingdom Ports

Ferromanganese, export	£14 Nominal
Tin plate, per base box	20s. 3d. to 21s. 6d.
Steel bars, open hearth.	£11
Beams, open-hearth	£10 12s. 6d.
Channels, open-hearth	£10 17s. 6d.
Angles, open-hearth	£10 12s. 6d.
Black sheets, No. 24 gage.	£13
Galvanized sheets, No. 24 gage	£15 5s.

CONTINENTAL

Per Gross Ton, Gold £. f.o.b. Continental Ports

Billets, Thomas	Nominal
Wire rods, No. 5 B.W.G.	£5 10s.
Steel bars, merchant	£5 5s.
Sheet bars	Nominal
Plate ¼ in. and up	£5 7s.
Plate 3/16 in. and 5 mm.	£5 13s.
Sheets ⅛ in.	£5 9s. 6d.
Beams, Thomas	£4 18s.
Angles (Basic)	£4 18s.
Hoops and strip, base	£5 12s.

RAW MATERIALS PRICES

PIG IRON

No. 2 Foundry

F.o.b. Everett, Mass.	$22.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa., and Sparrows Point, Md.	$22.00
Delivered Brooklyn	24.50
Delivered Newark or Jersey City	23.53
Delivered Philadelphia	22.84
F.o.b. Neville Island, Erie, Pa., Toledo, Chicago, Granite City, Cleveland and Youngstown*	21.00
F.o.b. Buffalo	21.00
F.o.b. Detroit	21.00
Southern, delivered Cincinnati	21.06
Northern, delivered, Cincinnati	21.44
F.o.b. Duluth	21.50
F.o.b. Provo, Utah	19.00
Delivered, San Francisco, Los Angeles or Seattle	24.50
F.o.b. Birmingham*	17.38

* Delivered prices on southern iron for shipment to northern points are 38c. a ton below delivered prices from nearest northern basing point on iron with phosphorus content of 0.70 per cent and over.

Malleable

Base prices on malleable iron are 50c. a ton above No. 2 foundry quotations at Everett, Eastern Pennsylvania furnaces, Erie and Buffalo. Elsewhere they are the same, except at Birmingham and Provo, which are not malleable iron basing points.

Basic

F.o.b. Everett, Mass.	$22.25
F.o.b. Bethlehem, Birdsboro, Swedeland and Steelton, Pa., and Sparrows Point, Md.	21.50
F.o.b. Buffalo	20.00
F.o.b. Neville Island, Erie, Pa. Toledo, Chicago, Granite City, Cleveland and Youngstown	20.50
Delivered Philadelphia	22.34
Delivered Canton, Ohio	21.89
Delivered Mansfield, Ohio	22.44
F.o.b. Birmingham	16.00

Bessemer

F.o.b. Buffalo	$22.00
F.o.b. Everett, Mass.	23.75
F.o.b. Bethlehem, Birdsboro and Swedeland, Pa.	23.00
Delivered Newark or Jersey City	24.53
Erie, Pa., and Duluth	22.00
F.o.b. Neville Island, Toledo, Chicago and Youngstown	21.50
F.o.b. Birmingham	22.00
Delivered Cincinnati	22.11
Delivered Canton, Ohio	22.89
Delivered Mansfield, Ohio	23.44

Low Phosphorus

Basing points: Birdsboro, Pa. Steelton, Pa., and Standish, N. Y.	$26.50

Gray Forge

Valley or Pittsburgh furnace	$20.50

Charcoal

Lake Superior furnace	$25.00
Delivered Chicago	28.34

Canadian Pig Iron

Per Gross Ton

Delivered Toronto

No. 1 fdy., sil. 2.25 to 2.75	$26.50
No. 2 fdy., sil. 1.75 to 2.25	25.50
Malleable	26.00
Basic	25.50

Delivered Montreal

No. 1 fdy., sil. 2.25 to 2.75	$27.50
No. 2 fdy., sil. 1.75 to 2.25	27.00
Malleable	27.50
Basic	27.00

FERROALLOYS

Ferromanganese

F.o.b. New York, Philadelphia, Baltimore, Mobile or New Orleans.

Per Gross Ton

Domestic, 80% (carload)	$92.50

Spiegeleisen

Per Gross Ton Furnace

Domestic, 19 to 21%	$28.00
Domestic, 26 to 28%	33.00

Electric Ferrosilicon

Per Gross Ton Delivered; Lump Size

50% (carload lots, bulk)	$69.50*
50% (ton lots in 50 gal. bbl.)	80.50*
75% (carload lots, bulk)	126.00*
75% (ton lots in 50 gal. bbl.)	139.00*

Bessemer Ferrosilicon

F.o.b. Furnace, Jackson, Ohio
Per Gross Ton

10.00 to 10.50%	$30.50

For each additional 0.50% silicon up to 12%, 50c. per ton is added. Above 12% add 75c. per ton.

For each unit of manganese over 2%, 1 per ton additional. Phosphorus 0.75% or over, $1 per ton additional.

Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Silvery Iron

Per Gross Ton

F.o.b. Jackson, Ohio, 5.00 to 5.50%	$24.50

For each additional 0.5% silicon up to 12%, 50c. a ton is added. Above 12% add 75c. a ton. The lower all-rail delivered price from Jackson or Buffalo is quoted with freight allowed. Base prices at Buffalo are $1.25 a ton higher than at Jackson.

Manganese, each unit over 2%, $1 a ton additional. Phosphorus 0.75% or over, $1 a ton additional.

Ferrochrome

Per Lb. Contained Cr., Delivered Carlots, Lump Size, on Contract

4 to 6% carbon	10.50c.*
2% carbon	16.50c.*
1% carbon	17.50c.*
0.10% carbon	19.50c.*
0.06% carbon	20.00c.*

Silico-manganese

Per Gross Ton, Delivered, Lump Size, Bulk, on Contract

3% carbon	$92.75
2.50% carbon	97.75
2% carbon	102.75
1% carbon	112.75

Other Ferroalloys

Ferrotungsten, per lb. contained W del., carloads, nominally	$2.00
Ferrotungsten, lots of 500 lbs. nominally	2.05
Ferrotungsten, smaller lots, nominally	2.10
Ferrovanadium, contract, per lb. contained V., delivered	$2.70 to $2.90†
Ferrocolumbium, per lb. contained columbium, f.o.b. Niagara Falls, N. Y., tons lots.	$2.25†
Ferrocarbontitanium, 15 to 18% Ti, 7 to 8% C, f.o.b. furnace carload and contract per net ton	$142.50
Ferrocarbontitanium, 17 to 20% Ti, 3 to 5% C, f.o.b. furnace, carload and contract, per net ton	$157.50
Ferrophosphorus, electric or blast furnace material, in carloads, f.o.b. Anniston, Ala., for 18%, with $3 unitage, freight equalized with Rockdale, Tenn., per gross ton	$58.50
Ferrophosphorus, electrolytic, 23-26% in car lots, f.o.b. Monsanto (Siglo), Tenn., 24%, per gross ton, $3 unitage, freight equalized with Nashville	$75.00
Ferromolybdenum, per lb. Mo. f.o.b. furnace	95c.
Calcium molybdate, per lb. Mo. f.o.b. furnace	80c.

*Spot prices are $5 per ton higher †Spot prices are 10c. per lb. of contained element higher.

ORES

Lake Superior Ores

Delivered Lower Lake Ports
Per Gross Ton

Old range, Bessemer, 51.50%	$5.25
Old range, non-Bessemer, 51.50%	5.10
Messabi, Bessemer, 51.50%	5.10
Messabi, non-Bessemer, 51.50%	4.95
High phosphorus, 51.50%	4.85

Foreign Ore

C.i.f. Philadelphia or Baltimore
Per Unit

Iron, low phos., copper free, 55 to 58% dry, Algeria	13c.
Iron, low phos., Swedish, average, 68½% iron	15c.
Iron, basic or foundry, Swedish, aver. 65% iron	13c.
Iron, basic or foundry, Russian, aver. 65% iron	Nominal
Man., Caucasian, washed 52%	35c.
Man., African, Indian, 44-48%	33c.
Man., African, Indian, 49-51%	35c.
Man., Brazilian, 46 to 48½%	33c.

Per Short Ton Unit

Tungsten, Chinese, Wolframite, duty paid, delivered	$20.00
Tungsten, domestic, scheelite delivered	$19.00 to $20.00
Chrome ore (lump) c.i.f. Atlantic Seaboard, per gross ton: South African (low grade)	15.00
Rhodesian, 45%	19.50
Rhodesian, 48%	23.00
Turkish, 48-49%	23.00 to 24.00
Turkish, 45-46%	19.00 to 20.00
Turkish, 40-44%	17.00 to 18.00
Chrome concentrates (Turkish) c.i.f. Atlantic Seaboard, per gross ton: 50%	26.00 to 27.00
48-49%	23.25 to 24.25

FLUORSPAR

Per Net Ton

Domestic washed gravel, 85-5, f.o.b. Kentucky and Illinois mines, all rail	$17.00 to $18.00
Domestic, f.o.b. Ohio River landing barges	18.00
No. 2 lump, 85-5, f.o.b. Kentucky and Ill. mines	18.00
Foreign, 85% calcium, fluoride, not over 5% silicon, c.i.f. Atlantic ports, duty paid	24.50
Domestic No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	31.50

FUEL OIL

Per Gal.

No. 2 or diesel, f.o.b. Bayonne.	4.125c.
No. 6, f.o.b. Bayonne	2.26c.
Del'd Chicago, No. 5 Bur. Stds.	3.25c.
Del'd Chicago, No. 6 Bur. Stds.	2.75c.
Del'd Cleve'd, No. 3 distillate	5.50c.
Del'd Cleve'd, No. 4 industrial	5.25c.
Del'd Cleve'd, No. 5 industrial	3.00c.
Del'd Cleve'd, No. 6 industrial	2.75c.

COKE

Per Net Ton

Furnace, f.o.b. Connellsville, Prompt	$3.75
Foundry, f.o.b. Connellsville, Prompt	$4.75 to 5.50
Foundry, by-product, Chicago ovens	10.25
Foundry, by-product, del'd New England	12.50
Foundry, by-product, del'd Newark or Jersey City	10.88 to 11.40
Foundry, by-product, Philadelphia	10.95
Foundry, by-product, delivered Cleveland	10.30
Foundry, by-product, delivered Cincinnati	9.75
Foundry, Birmingham	7.50
Foundry, by-product, del'd St. Louis industrial district	10.75 to 11.00
Foundry, from Birmingham, f.o.b. cars dock, Pacific ports	14.75

Government Purchases In Week Ended Oct. 22

DURING the week ended Oct. 22, 1938, various departments of the Federal Government bought iron and steel products valued at $355,535, non-ferrous metals and alloys valued at $27,108, machinery listed at $540,740, electrical apparatus and supplies at $1,183,792, and transportation equipment valued at $21,932,424. Four torpedo boat destroyers were ordered by the Navy. Principal contracts awarded during that week by Government departments are:

IRON, STEEL PRODUCTS:

Noland Co., Inc., Washington, Treasury—bolts, nuts, etc.	$13,442.00
National Tube Co., Pittsburgh, War, Ordnance—shell forgings	76,534.20
Jackes-Evans Mfg. Co., St. Louis, Mo., CCC, War—stovepipe elbows	12,531.13
The Babcock & Wilcox Tube Co., Beaver Falls, Pa., Navy—steel tubing	12,224.05
Bethlehem Steel Co., San Francisco, War, Engineers—reinforcing bars	20,860.00
Concrete Steel Co., New York, WPA, Treasury—reinforcing rods	22,873.03
Hart Mfg. Co., Louisville, Ky., CCC, War—stoves and parts	10,224.55
Detroit-Michigan Stove Co., Detroit, War, QMC—gas ranges	27,200.00
Golden Gate Iron Works, San Francisco, San Fran. Purch. Off.—structural steel	25,956.00
Bethlehem Fabricators, Inc., New York, WPA, Treasury—structural steel	29,354.27
Somaron Sheet Metal Works, Inc., Bronx, New York, WPA, Treasury—stainless steel	25,300.00
Wickwire Spencer Steel Co., New York, War, Engineers—wire fabric	21,127.68
American Steel & Wire Co. of N. J., Washington, Norfolk Navy yard—cable	37,155.59
Service Machine Co., Inc., Elizabeth, N. J., War, Ordnance—machine gun parts	20,752.50

NONFERROUS METALS AND ALLOYS:

The International Nickel Co., Inc., New York, Navy—nickel	16,325.00
The International Nickel Co., Inc., New York, Navy—nickel-copper alloy forgings	16,783.30

MACHINERY:

Tidewater Supply Co., Inc., Norfolk, Va., Navy—lathe	10,758.60
Barnes Drill Co., Rockford, Ill., War, Ordnance—honing and lapping machinery	19,348.00
Northwest Engineering Co., Chicago, Agriculture—power shovels	32,314.00
Miehle Printing Press & Mfg. Co., Chicago, Govt. Printing Off.—printing presses	110,140.00
Northern Pump Co., Minneapolis, Navy, S&A—pumps	126,717.24
Worthington Pump & Machinery Corp., Washington, Navy, S&A—pumps	143,566.00
Allis-Chalmers Mfg. Co., Milwaukee, CCC, Interior—graders and tractors	46,100.54
The American Laundry Machinery Co., Cincinnati, Marine Corps—laundry machinery	41,665.00
The Jaeger Machine Co., Columbus, Ohio, Farm Security Adm.—concrete mixers	10,130.88

ELECTRICAL APPARATUS & SUPPLIES:

Battery Distributing Corp., Niagara Falls, N. Y., Treasury—storage batteries	210,609.00
General Electric Co., Schenectady, N. Y., Norfolk Navy yard—cable	22,613.24
Nathan Goodman Co., Inc., Washington, Treasury—raceway metal	10,152.00
Westinghouse Elec. & Mfg. Co., New York, N. Y. Purch. Off.—arc welding mach.	12,090.00
Westinghouse Elec. & Mfg. Co., Washington, War, Signal Corps—radio receiving sets	752,103.50
Firestone Tire & Rubber Co., Akron, Ohio, Treasury—spark plugs	66,374.00
Teletype Corp., Chicago, War, Signal Corps—teletype mach.	24,016.98
General Electric Supply Corp., Washington, Treasury—elec. supplies	19,009.00
Warner Electric Brake Mfg. Co., Beloit, Wis., War, Ordnance—electric brakes	66,825.00

TRANSPORTATION EQUIPMENT:

United Aircraft Corp., Pratt & Whitney Aircraft Div., E. Hartford, Conn., Navy—engines and parts	240,282.46
Bath Iron Works Corp., Ltd., Bath, Me., Navy, Ordnance—torpedo boat destroyer	5,067,000.00
Bath Iron Works Corp., Ltd., Bath, Me., Navy, Ordnance—torpedo boat destroyer	5,067,000.00
Federal Shipbuilding & Dry Dock Co., Kearny, N. J., Navy, Ordnance—torpedo boat destroyer	5,082,000.00
Federal Shipbuilding & Dry Dock Co., Kearny, N. J., Navy, Ordnance—torpedo boat destroyer	5,082,000.00
Bethlehem Shipbuilding Corp., Ltd., N. Y. C., Navy, Ordnance—fleet tug	1,226,000.00
George Cole Motor Co., Nashville, Tenn., Farm Security Adm.—trucks	25,280.80
International Harvester Co., Inc., Washington, Farm Security Adm.—trucks	71,960.00
Yellow Truck & Coach Mfg. Co., Farm Security Adm.—trucks	33,760.86
General Motors Corp. (Chev. Div.), Detroit, Interior—trucks	37,140.60

October Iron Output Climbs 18.3 Per Cent

PRODUCTION of coke pig iron in October totaled 2,054,000 gross tons, compared with 1,680,435 tons in September. The daily rate last month, at 66,258 tons, increased 18.3 per cent over the 56,015 tons produced daily in September, and was the highest since November, 1937, when it was 66,891 tons.

There was a gain of 19 furnaces, 115 furnaces being in blast on Nov. 1, against 96 on Oct. 1.

Among the furnaces blown in were the following: Two Edgar Thomson, two Ohio, and two South Chicago (old), Carnegie-Illinois Steel Corp.; two Ensley, Tennessee Coal, Iron & Railroad Co.; one Lorain, National Tube Co.; one Donner, one Haselton, one United, and one Pioneer, Republic Steel Corp.; one Susquehanna and one Zug Island, National Steel Corp.; one Eliza, Jones & Laughlin Steel Corp.; one Swede, Alan Wood Steel Co.; one Standish, Chateaugay Ore & Iron Co., and one Oriskany, E. J. Lavino & Co.

(Complete tabulations will be published next week.)

4000 More Join Steel Payrolls

EMPLOYMENT in steel continued to rise during September, according to a report released today by the American Iron and Steel Institute showing that 431,000 employees were on the payrolls during September. In the preceding month steel employment averaged 427,000. Payrolls totaled $52,365,000, almost equal to the August total of $52,712,000 despite the shorter month. With that exception, steel payrolls in September exceeded the total for any month since November, 1937. In September a year ago the industry paid $86,161,000 to 603,000 employees.

Wage-earning employees of the industry earned an average of 83c. per hr. in September which compares with 83.2c. in August and with 83.7c. in September, 1937. An average of 30 hr. a week was worked by wage earners in September as against 29.4 hr. in August and 36.8 hr. in September of last year.

Only Two Bidders on Cargo-Passenger Ships

THE Newport News Shipbuilding & Drydock Co. and the Bethlehem Steel Co.'s shipbuilding and repair division were the only bidders on Tuesday when the maritime commission opened bids for the construction of three combination cargo-passenger vessels for the account of the Mississippi Shipping Co. Bids were based on both a fixed and adjusted price basis for one, two or three of the ships. The three ships will require about 12,420 tons of steel.

NON-FERROUS

. . . Demand is lighter, but shipments are maintained at a good pace.

COPPER sales in the past week were about 6000 tons, the bulk of which were accounted for by inter-company transactions. Despite the lack of active buying interest in the past week, favorable industrial news and the slowly improving rate of shipments, have kept the present price level of 11.25c. per lb., Connecticut Valley, well supported. Further heavy buying is not anticipated until material covered during the recent war scare is worked into consumption. The foreign market has been alternately active and dull, with the price slowly working lower. This morning's foreign price of 11.15c. per lb., represents a decline of 15 points from the price of a week ago.

LEAD bookings in the week past totaled close to 8500 tons, or 1500 tons below the previous week's total. Inquiry is, however, still fairly active from practically all sources, and several sellers have been persistently disposing of their daily intake. Domestic prices continue very firm at 4.95c. per lb., St. Louis. The inauguration of the output restriction plan of the newly formed foreign cartel was accompanied by heavy consumer buying in London. Today's first session in London involved 1900 tons at 3.41c. bid on spot metal.

ZINC sales declined again last week, the week's total being 1535 tons. Shipments were also lower but are at present double the weekly sales figure. Although at present the market is very quiet, sentiment is still on the bullish side. The 39,851-ton backlog of undelivered orders, equal to about two months' production, is the chief factor supporting the present price level of 5.05c. per lb., East St. Louis. For the past two days buying interest has been centered on small fill-in lots for prompt shipment.

TIN buying is still limited to occasional carlots, with very little long-term interest being indicated. Despite the dullness, prices have been on the firm side all week. Today's Straits quotation of 46.50c., New York, is identical with the price of a week ago.

NON-FERROUS PRICES

Cents per lb. for early delivery

	Oct. 26	Oct. 27	Oct. 28	Oct. 29	Oct. 31	Nov. 1
Electro. copper[1]	11.25	11.25	11.25	11.25	11.25	11.25
Lake copper	11.375	11.375	11.375	11.375	11.375	11.375
Straits, tin, New York	46.25	46.35	46.00	....	46.10	46.50
Zinc, East St. Louis[2]	5.05	5.05	5.05	5.05	5.05	5.05
Lead, St. Louis[3]	4.95	4.95	4.95	4.95	4.95	4.95

[1] Delivered Conn. Valley, deduct ¼c. for New York delivery. [2] Add 0.39c. for New York delivery. [3] Add 0.15c. for New York delivery.

Warehouse Prices

Base per lb., Delivered

	New York	Cleveland
Tin, Straits pig	47.50c.	50.00c.
Copper, lake	12.25c.	12.375c.
Copper, electro	11.50c.	12.375c.
Copper, castings	11.25c.	11.875c.
*Copper sheets, hot-rolled	19.375c.	19.375c.
*High brass sheets	17.50c.	17.50c.
*Seamless brass tubes	20.25c.	20.25c.
*Seamless copper tubes	19.875c.	19.875c.
*Brass rods	13.375c.	13.375c.
Zinc slabs	6.50c.	7.50c.
Zinc sheets, No. 9 casks	10.50c.	12.10c.
Lead, American pig	5.875c.	5.60c.
Lead, bar	6.625c.	8.75c.
Lead sheets, cut	8.25c.	8.25c.
Antimony, Asiatic	15.00c.	17.75c.
Alum., virgin, 99 per cent plus	22.50c.	22.50c.
Alum., No. 1 remelt., 98 to 99 per cent	19.50c.	19.50c.
Solder, ½ and ½	29.25c.	30.00c.
Babbitt metal, commercial grade	20.25c.	22.75c.

* These prices, which are also for delivery from Chicago warehouses, are quoted with the following percentages allowed off for extras: on copper sheets, 33 1/3; on brass sheets and rods, 40, and on brass and copper tubes, 25.

Old Metals Per Lb., New York

Buying prices are paid by dealers for miscellaneous lots from smaller accumulators. Selling prices are those charged to consumers after the metal has been prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	9.00c.	9.75c.
Copper, hvy. and wire	8.00c.	8.50c.
Copper, light and bottoms	7.25c.	7.50c.
Brass, heavy	4.875c.	5.375c.
Brass, light	3.875c.	4.625c.
Hvy. machine composition	7.25c.	8.75c.
No. 1 yel. brass turnings	4.50c.	5.00c.
No. 1 red brass or compos. turnings	6.875c.	7.50c.
Lead, heavy	4.125c.	5.00c.
Cast aluminum	7.25c.	8.50c.
Sheet aluminum	11.50c.	13.00c.
Zinc	2.50c.	3.75c.

Miscellaneous Non-Ferrous Prices

ALUMINUM, delivered; virgin 99 per cent plus, 20c.-21c. a lb.; No. 12 remelt, No. 2 standard, 19c.-19.50c. a lb. NICKEL, electrolytic, 35c.-36c. a lb. base refinery, lots of 2 tons or more. ANTIMONY, prompt, New York; Asiatic, 14c. a lb., f.o.b.; American, 12.25c. a lb. QUICKSILVER, $75-$78 per flask of 76 lb. BRASS INGOTS, commercial 85-5-5-5, 11.625c. a lb. lcl.

Bethlehem Reports Small Profit at 46.4%

BETHLEHEM STEEL CORP. reported for the three months ended Sept. 30, 1938, a net profit of $446,866, with steel output averaging 46.4 per cent, compared with a net profit of $150,305 on 35.7 per cent operations in the previous quarter and with a profit of $9,249,560 on 85.1 per cent operations during the third quarter of last year.

Estimating the company's current ingot production rate at 56 per cent, a rate he said probably would be maintained or increased during the remainder of 1938, Eugene G. Grace, Bethlehem president, reported the company's average net billing prices in the third quarter were $3.92 under those of the second quarter.

Recent price weakness in sheets and strip was attributed to offerings of lower prices by some steel companies rather than pressure from the automobile companies, Mr. Grace said. While bookings of flat rolled steel for that industry were considerable at the lower prices, all of the tonnage placed will be shipped and consumed before the end of 1938, he said.

Bethlehem's shipments of finished steel products in the third quarter totaled 790 000 tons, compared with 639,000 tons in the second quarter. Its unfilled orders on Sept. 30 totaled $101,528,356, against $89,916,012 on June 30, 1938, and $125,820,124 on Sept. 30, 1937.

Among the steel and allied companies reporting third quarter earnings this past week were:

	3rd Quar. 1938	2nd Quar. 1938	3rd Quar. 1937
National Steel Corp.	$1,813,997	$1,005,863	$5,227,071
Inland Steel Co.	1,098,245	1,135,097	4,433,375
American Rolling Mill Co.	556,994*	525,845*	2,646,525
Wheeling Steel Corp.	606,908	624,888*	1,230,192
Keystone Steel & Wire Co.	89,224	304,054	203,693
Otis Steel Co.	465,596*	520,101*	948,285
M. A. Hanna Co.	169,431	163,038	972,217

* Loss.

FABRICATED STEEL

. . . Lettings decline to 18,400 tons from 33,350 tons last week . . . New projects lower at 21,000 tons as against 24,650 tons a week ago . . . Plate awards call for only 710 tons.

NORTH ATLANTIC STATES

AWARDS

6450 Tons, Philadelphia Navy Yard; 3825 tons for structural assembly shop, to Bethlehem Steel Co., Bethlehem, Pa.; 2625 tons, turret shop and crane runway to American Bridge Co., Pittsburgh.

1225 Tons, Baltimore, office building, Monumental Life Insurance Co., to American Bridge Co., Pittsburgh; Consolidated Engineering Co., general contractor.

860 Tons, Washington, municipal court building for District of Columbia, to Fort Pitt Bridge Works Co., Pittsburgh.

750 Tons, Woodbridge, N. J., Pennsylvania Railroad grade crossing elimination, to American Bridge Co., Pittsburgh, James Stewart & Co., general contractors.

500 Tons, State of Massachusetts, flood repairs to bridges, to American Bridge Co., Pittsburgh, Lane Construction Co., Meriden, Conn., general contractor.

460 Tons, Mount Gretna, Pa., prison, to Bethlehem Steel Co., Bethlehem, Pa.

340 Tons, Farmington, Conn., State highway bridge, to Phoenix Bridge Co., Phoenixville, Pa.; Arute Brothers general contractors.

270 Tons, Plainfield, N. J., hospital, to Savary & Glaeser, Dunellen, N. J.; A. L. Hartridge & Co. Inc., general contractor.

260 Tons, Greenhaven, N. J., prison, to Bethlehem Contracting Co., Bethlehem, Pa., Arthur Gallow, Inc., general contractor.

260 Tons, Brookhaven, Long Island, grade crossing elimination, to American Bridge Co., Pittsburgh; Zara Contracting Co., general contractor.

260 Tons, New York, Brazilian building for World's Fair, to Ingalls Iron Works Co., Birmingham; Hegeman-Harris, general contractor.

235 Tons, New York, National Dairy Products building for World's Fair, to Bethlehem Fabricators, Inc., Bethlehem, Pa.; Tidewater Building Co., general contractor.

200 Tons, Buckland-Lyden, Mass., bridges, to Bethlehem Steel Co., Bethlehem, Pa.; Kelleher Corp., Turners Falls, Mass., contractor.

160 Tons, Lafayette, Ind., Chemical Engineering building, to Indiana Bridge Co., Muncie, Ind.

145 Tons, Buffalo, hangar No. 6 at Buffalo Airport, to A. Feine & Sons Co., Buffalo.

140 Tons, New York, police station, 306 West 54th Street, to Belmont Iron Works, Philadelphia.

135 Tons, Ridgefield, Conn., high school, to an unnamed bidder.

135 Tons, Phillipsburg, N. J., two State bridges, to Easton Structural Steel Co., Easton, Pa.

125 Tons, Towanda, Pa., State highway maintenance building, to American Bridge Co., Pittsburgh.

120 Tons, Cambridge, Mass., sanatorium addition, to West End Iron Works, Cambridge.

110 Tons, Wilkes-Barre, Pa., maintenance building, Pennsylvania Department of Highways, to Bethlehem Steel Co., Bethlehem, Pa.

105 Tons, Gettysburg, Pa., garage for Department of Highways, to an unnamed bidder.

100 Tons, New York, Missouri State building at World's Fair, to Grand Iron Works, New York.

100 Tons, Bradford, Vt., bridge, to American Bridge Co., Pittsburgh.

100 Tons, Presque Isle Me. school, to Lyon Iron Works, Manchester, N. H.

THE SOUTH

425 Tons, Savannah, Ga., National Gypsum Co. plant, to Ingalls Iron Works Co., Birmingham; George A. Fuller Co., general contractor.

215 Tons, Hemphill County, Tex., bridge, to Austin Brothers, Dallas, Tex. Jensen Construction Co. Austin, general contractor.

165 Tons, Coalwood, W. Va., bin structure for Carter Coal Co., to Tippett & Wood, Phillipsburg, N. J.

110 Tons, Bath County, Va., bridge, to Virginia Bridge Co., Roanoke, Va.

CENTRAL STATES

330 Tons, Toledo, Ohio, structural supports, Sun Oil Co., to Bethlehem Steel Co. Bethlehem, Pa.

265 Tons, Trenton, Mich., Case structure, to Whitehead & Kales Co., Detroit; E. B. Bodger & Sons, general contractor.

200 Tons, Chicago, repairs to Dearborn Street bridge, to Joseph T. Ryerson & Son, Inc., Chicago.

185 Tons, Grand Rapids, Mich., State bridge, to Wisconsin Bridge & Iron Co., Milwaukee; Hilding Construction Co., general contractor.

160 Tons, Lafayette, Ind., dormitory, to Hugh J. Baker Co., Indianapolis.

WESTERN STATES

400 Tons, Mare Island, Cal., nine Navy Yard buildings, to Golden Gate Iron Works, San Francisco.

HAWAII

2556 Tons, Honolulu, shapes and sheet piling for United States Engineer, to Columbia Steel Co., San Francisco.

NEW STRUCTURAL STEEL PROJECTS

NORTH ATLANTIC STATES

4500 Tons, New York, three additional hangars at North Beach Airport; bids in.

2000 Tons, Brooklyn, building No. 4 at Navy Yard; Hudson Contracting Co., New York, low bidder on general contract.

900 Tons, Providence, R. I., parcel post building George Fuller Construction Co., Boston, low bidder on general contract.

1000 Tons, Buffalo, Kenmore school.

600 Tons, Herkimer County, N. Y., including 70 tons reinforcing bars, highway project R.C. 4000; Green Island Construction Co., Inc., Green Island, N. Y., low bidder on general contract.

600 Tons, Absecon, N. J., grade crossing; bids due Nov. 15.

400 Tons, Hagerstown, Md., City Hall.

300 Tons, Washington, garage for District of Columbia Commissioners.

200 Tons, Mahoning, Pa., high school.

135 Tons, Shelbourne Falls, Mass., Buckland bridges.

130 Tons, Bloomsburg, Pa., Red Rock bridge for Columbia County.

125 Tons, Albany, N. Y., parish house for Dutch Reformed Church.

125 Tons, Franklin, N. H., high school.

125 Tons, Parlin, N. J., process building, chlorinated rubber plant for Hercules Powder Co.

115 Tons, Newark, Del., University of Delaware buildings.

SOUTH AND SOUTHWEST

3500 Tons, Portsmouth, Va., crane runway and structural shop.

1250 Tons, Selma, Ala., bridge.

900 Tons, Roswell, N. M., State bridge, FAP-12.

300 Tons, Fort Myer, Va., warehouse for War Department.

CENTRAL STATES

1600 Tons, Rulo, Neb., Richardson County bridge over Missouri River; bids Nov. 7.

1500 Tons, Cleveland, Ambler Park apartments.

1000 Tons, Chicago, State Psychiatric Hospital; bids Nov. 10.

700 Tons, Dearborn County, Ind., State bridge over Tanner's Creek.

400 Tons, Wauwatosa, Wis., fourth unit, Junior-Senior High School.

400 Tons, Lincoln, Neb., 48th Street viaduct; bids Nov. 3.

200 Tons, Terre Haute, Ind., Y.M.C.A. building.

150 Tons, Bradley, Mich., State Highway bridge.

150 Tons, Lombard, Ill., grade separation bridge for Chicago Great Western Railroad.

130 Tons, Watson, Minn., State bridge No. 5739.

100 Tons, Blakeslee, Ohio, State grade elimination; bids Nov. 4 (also 15 tons of alloy steel and 20 tons of reinforcing bars).

Unstated tonnage, Chicago, State highway department building.

WESTERN STATES

1350 Tons, San Clemente Island, Cal., Navy hangars; previous general contract award rescinded and reawarded to L. A. Contracting Co., Los Angeles.

645 Tons, Mare Island, Cal., structural angles for destroyer tender Fulton; bids opened.

410 Tons, Logan, Utah, field house for Utah State Agricultural College.

170 Tons, Los Angeles, Verdugo Wash bridge for United States Engineer; bids Nov. 7.

170 Tons, Los Angeles, San Fernandod Road bridge for United States Engineer; bids Nov. 7.

137 Tons, Los Angeles, Prado Dam; Emsco Derrick & Equipment Co., low bidder.

115 Tons, Clackamas County, Ore., Shipley bridge; bids Nov. 17.

FABRICATED PLATES

AWARDS

445 Tons, Wheaton, Md., standpipe, to Chicago Bridge & Iron Works, Chicago.

265 Tons, Ambridge, Pa., standpipe, to Chicago Bridge & Iron Works, Chicago; Walter S. Rae, Pittsburgh, contractor.

NEW PROJECTS

Unstated tonnage, Portland, Ore., 520,000 gal. diesel oil tank and piping for United States Engineer; bids Nov. 15.

900 Tons, Seattle, geodetic survey vessel; Lake Washington shipyards, builder.

SHEET PILING

NEW PROJECTS

400 Tons, Cleveland, Cuyahoga River improvement; L. A. Wells Construction Co., Cleveland, low bidder.

200 Tons, Morgan County, Ohio, State highway improvement.

. CAST IRON PIPE .

Hartford, Conn., Water District Commission closed bids Oct. 31 on about 1 3/16 miles of 36 and 42-in. pipe.

Sanford, Me., has awarded 300 tons of 16-in. pipe to R. D. Wood Co.

North Stratford, N. H., has placed 5500 ft. of 10-in. pipe with Warren Foundry & Pipe Corp.

Afton, Okla., closes bids Nov. 7 for 10,000 ft. of 2-in.; also for 50,000-gal. elevated steel tank and tower, deep-well pumping unit with rating of 150 gal. per min., and other waterworks equipment. H. T. Lawrence, 3234 N.W. Fourteenth Street, Oklahoma City, is consulting engineer.

Trenton, Tex., asks bids until Nov. 14 for pipe lines for water system; also for 50,000-gal. elevated steel tank and tower, motor-driven deep-well turbine pumping unit with 75 gal. per min. capacity, and other waterworks installation. Joseph J. Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Raleigh, N. C., plans 16-in. pipe in western part of city for main water supply; also new 750,000 gal. elevated steel tank and tower at Chamberlain Street and Second Avenue, pumping equipment, extensions in filtration plant and other waterworks installation. Cost about $385,000. R. L. Williamson is public works commissioner in charge.

Gardner, Ill., plans pipe lines for water system. Fund of $83,400 is being arranged through bond issue, recently voted, and Federal aid for this and other waterworks installation.

Rouge River, Ore., closes bids Nov. 7 for 17,300 ft. of 2, 4 and 6-in. pipe and other waterworks installation. Paul Rynning, Court House, Medford, Ore., is consulting engineer.

Brownfield, Tex., closes bids Nov. 14 for 6-in. pipe for water system for about 40 city blocks; also for 150,000-gal. elevated steel tank and tower, two pumping units of 500 and 350-gal. per min. rating, 100,000-gal. concrete ground storage reservoir, and other waterworks installation. H. N. Roberts, Lubbock, Tex., is consulting engineer.

Drake, N. D., plans about 12,000 ft. of pipe, various sizes, for water system. Fund of $38,000 is being arranged for this and other waterworks installation, of which $21,000 will represent a bond issue and $17,000 a Federal grant. Lium & Burdick, YMCA Building, Grand Forks, N. D., are consulting engineers.

Cambridge, Neb., plans pipe lines for water system and other waterworks installation. Cost about $43,000. Financing is being arranged. H. H. Henningson, Union State Bank Building, Omaha, Neb., is consulting engineer.

Big Springs, Tex., closes bids Nov. 8 for pipe for water system and other waterworks installation, including filtration equipment. Marvin C. Nichols, Capps Building, Fort Worth, Tex., is consulting engineer.

Hallsville, Tex., asks bids until Nov. 9 for pipe for water system and other waterworks installation. Fund of $32,000 has been arranged through Federal aid. Joseph J. Rady, Majestic Building, Fort Worth, Tex., is consulting engineer.

Manawa, Wis., plans new system estimated to cost $149,090, and has voted bond issue and made application for PWA grant. J. C. Kinsman is village clerk.

Poynette, Wis., has applied for PWA and WPA loans and grants for waterworks system estimated to cost $100,000. J. L. Kebaugh is village clerk.

Medford, Ore., asks bids until Nov. 10 for 14,000 ft. of 3 to 8-in., 4500 ft. of galvanized iron pipe, ¾ to 2-in.; also for fittings, valves, etc., and elevated steel tank and tower. Cost about $35,750. Financing has been arranged through Federal aid. Paul Rynning, Court House, is consulting engineer.

Sweet Home, Ore., asks bids Nov. 15 for construction of water system, including pumps, filter, chlorinator, reservoir, and 36,000 ft. of 2 to 10-in. cast iron pipe. H. L. Gilbert, 714 Couch Building, Portland, is engineer.

Treasury Department Procurement Office, Reno, Nev., asks bids Nov. 4 on 14,300 ft. of 6 and 8-in. cast iron pipe for delivery at Lovelock, Nev.

Industry Speaks

EUGENE G. GRACE — "Industry has had a vast growth in the past 30 years. Our activities as managers and employees, like the activities in other large companies, have a marked effect on the prosperity of our immediate communities and on the well-being of the public at large."

CHARLES R. HOOK—"The American business man today is an enlightened progressive individual who seeks to make such adjustments in his economic and industrial relations as may be advisable or necessary, but he dislikes force and coercion. He resents being reformed by the sandbag method."

PAUL MACKALL, vice-president in charge of sales, Bethlehem Steel Corp.—"I'm vice-president in charge of gifts."

Industry Listens

"As long as a great majority of our voters think Federal expenditures are not costing them anything, the effect on public opinion is disastrous to an economical and efficient government." — ALFRED M. LANDON.

"It (the CIO) seeks to destroy none of the institutions of our fathers, only to make them respond more effectively to the demands of social justice within the democratic state. It is based upon the wage system, the institution of private property, the rights to investment profit, the freedom of contract."—JOHN L. LEWIS.

. GREAT BRITAIN .

. . . Pig iron stocks being reduced in England.

LONDON, Nov. 1 (*By Cable*).—The British pig iron outlook is now brighter as stocks are being reduced, but no immediate substantial production increase is envisaged. Consumers are not buying beyond this year's delivery, awaiting 1939 price announcements. There is a good potential Italian demand for hematite, but merchants are unable to arrange satisfactory credits.

Some steel departments report brisker demand, but many plants still are idle. There is no improvement in merchant shipbuilding, but the intensification of national defense is expected to release substantial quantities of structural steel. Sheet rollers are hoping for good motor trade orders.

The export steel market is quiet, except for Empire inquiry.

The Continent reports business still active, though area demand is still restricted, but the outlook is regarded more hopefully. Activity is mainly in merchant bars and plates.

The International Tube Cartel has been provisionally prolonged until Jan. 31.

Tin plate demand is much improved with heavy home sales up to end of first quarter and substantial inquiries, but the recent rise in tin makes the tin plate makers chary on quoting for far forward business. There is moderate export business for nearby deliver. Unfilled orders are now over 2,500,000 base boxes.

Black sheets are quiet except in special quality for home trade, chiefly motor body work. There is a moderate home demand for defense schemes. Export is sluggish.

THIS WEEK'S MACHINE ...TOOL ACTIVITIES...

... Spotty improvement seen in many districts ... October volume showing a gain over September ... Foreign orders off in past week.

Spotty Improvement Shown In the Middle West

CHICAGO—Business of machine tool sales offices here continued to show spotty improvement in the past week. At the same time, inquiries continued to appear in sufficient volume to brighten the outlook in some offices. One seller reports that October will be the best month thus far in the year for machinery sales and considerably ahead of September in sales of small tools. Demand still is from miscellaneous sources and for only one or two items generally, the bulk of it being attributed to replacement needs. Attitude in some quarters of the trade is that manufacturers in many cases are holding off on commitments for equipment until after the elections.

October Showed Gain in Sales in Cleveland

CLEVELAND — October proved definitely a better month than September from the standpoint of sales in this district. Among the recent orders closed are three lathes for the Westinghouse plant at Lima, understood to have been allocated with three different manufacturers, a 16-in. lathe and other equipment for G-E's Nela Park plant, and several machines for a manufacturer of materials handling equipment.

A number of propositions involving planers and shapers are active, along with some special-purpose machinery for Ford. In some quarters it is believed the advent of the new Wages and Hours law has hampered business during the past week.

Domestic Ordering Steady Cincinnati Builders Report

CINCINNATI — Machine tool levels were lowered the past week when foreign interest lagged for the first time in recent weeks. In some instances, manufacturers reported no export business at all, while a few indicated that no interest even by way of inquiry was displayed from this source. Domestic ordering, however, continues to be encouraging, not from the volume, but from the regularity of orders and the fact that market averages from home sources are fairly steady. Requests for quotations are still relatively brisk. Ordering reflects willingness to close for small tools more often, although the heavier types are not without demand.

Factory operation is about 40 per cent of capacity. Some plants are running five night shifts a week.

Eastern Dealers Encouraged By Better October Volume

NEW YORK—In some quarters there has been a fair volume of orders placed in the past week, and some of this business has come from general industrial sources. One comment was heard to the effect that inquiries and orders had been coming from some firms of lesser prominence that had not been considered active prospects for some time. On the other hand, some dealers still report only the occasional sale of a few small tools, so that to this extent the market is still spotty. On the average, however, the October order volume has been much above that of September. The Brooklyn Navy Yard has begun to buy against its 1938-39 budget, but nothing has developed in the way of a sizable list as yet.

New Style Automobile Seat To Be Made in Detroit

DETROIT—Looming on the horizon for the automobile industry is a plant for the production of a new kind of automobile seat. Production plans are not yet complete enough for detailed discussion. At present the machine tool suppliers are completing installations at the modern Norge refrigerator plant which will be operating in six or eight weeks.

Hamilton Foundry Holds "Open House"

HAMILTON Foundry & Machine Co., maker of light and medium castings since 1891, on Oct. 8 held an "open house" for employees and their families at its Hamilton, Ohio, plant. Later the company held a similar celebration for its customers.

Organized to care for surplus casting business obtained by the old Sohn & Rentschler Foundry partnership, the Hamilton company is one of the interests founded by George Adam Rentschler.

Officers of Hamilton Foundry & Machine are Peter E. Rentschler, president and chairman, Don McDaniel, vice-president, and H. A. Rentschler, secretary and treasurer. These three, with Frederick B., G. A. and Walter A. Rentschler, comprise the board of directors.

Machine Tool Exhibits to Triple 1938 Detroit Show

DETROIT.—Details of the second annual Machine and Tool Progress Exhibition, to be held in Detroit March 14 to 18, were announced this week by Frank A. Shuler, Chrysler Corp., and chairman of the show committee.

As previously announced, the show will be held in Convention Hall, Detroit, the locale of last year's successful exhibition. According to reservations already being received at the headquarters' offices of the American Society of Tool Engineers, sponsors of the show, the exhibition will roughly triple the size of the 1938 exhibition. Exhibits will cover all forms of machines, tools, equipment and processes of interest to manufacturing executives in the mass production industries.

Structural Bookings Decline in September

BOOKINGS of fabricated structural steel in September totaled 89,828 tons, as compared with 102,539 tons in August and 132,432 tons in September a year ago, according to the American Institute of Steel Construction. Total bookings in the first nine months of the present year aggregate 769,621 tons against 1,334,469 tons in the comparable period of 1937.

Shipments of fabricated steel also declined in September, but not as sharply as new orders. The month's total of 90,900 tons compares with 91,923 tons in the preceding month and 163,541 tons in September, 1937. Shipments for the year through September totaled 831,345 tons. In a similar period of 1937, 1,266,095 tons was shipped.

The volume of new business booked this year, when measured by quarters, indicates a constant although small improvement. Total bookings in the first quarter were 221,721 tons, in the second quarter 268,379 tons and in the third quarter 279,521 tons.

PLANT EXPANSION AND EQUIPMENT BUYING

NORTH ATLANTIC

Weldrods Corp., subsidiary of Air Reduction Co., 60 East Forty-second Street, New York, recently organized to manufacture welding rods, wire, etc., has let general contract to Albert M. Higley Co., 2036 East Twenty-second Street, Cleveland, for initial unit of new plant on East Forty-ninth Street, near Grand Avenue, Cuyahoga Heights, Cleveland, to be one-story, 109 x 280 ft. Cost about $150,000 with equipment. Other units will be built later.

Sheffield Farms Co., Inc., 524 West Fifty-seventh Street, New York, has let general contract to White Construction Co., 95 Madison Avenue, for multi-story addition to dairy products plant on Eleventh Avenue, near Fifty-seventh Street, connecting two existing buildings and forming final unit of plant. Cost about $600,000 with equipment.

Richardson & Boynton Co., 244 Madison Avenue, New York, manufacturer of furnaces, etc., has asked bids on general contract for one-story addition to plant at Whitesboro, N. Y. Cost close to $50,000 with equipment. Eadie, Freund & Campbell, 110 West Fortieth Street, New York, are consulting engineers.

Celanese Corp. of America, Inc., 180 Madison Avenue, New York, has authorized plans for new mill near Pearisburg, Va., on 1200-acre tract acquired several months ago, and will begin work on initial buildings early in 1939. Plant will include power house, pumping station, machine shop and other mechanical departments. Cost about $5,000,000 with machinery. Closely following completion of initial plant, work will begin on second unit to double capacity, to cost a like amount, making total investment of $10,000,000. Financing has been arranged. W. M. C. Cameron is vice-president in charge of operations; Aaron Schwartz is company engineer.

American Airlines, Inc., Chicago, and 25 Vanderbilt Avenue, New York, has leased three steel hangars, totaling 300,000 sq. ft. of floor space, at New York municipal airport and terminal, North Beach, Queens, L. I., now in course of erection. Company will remove main repair shops from Chicago to new location when structures are ready for occupancy, with installation of additional equipment for parts production, reconditioning, etc., giving employment to more than 100 persons.

Socony-Vacuum Oil Co., Inc., 26 Broadway, New York, has authorized expansion and improvements in oil refinery at Beaumont, Tex., including additional equipment, to operate under Houdry process for gasoline production. Several new plant units will be built. Cost over $5,000,000 with machinery.

Wright Aeronautical Corp., 132 Beckwith Avenue, Paterson, N. J., has let general contract to Mahony-Troast Construction Co., 657 Main Avenue, Passaic, N. J., for two-story addition, for assembling, testing and other operations. Cost about $150,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Bureau of Yards and Docks, Navy Department, Washington, through Public Works Officer, Building No. 1, Navy Yard, Philadelphia, has asked bids on general contract for superstructure for one-story addition to local structural assembling shop, 320 x 400 ft., including crane runways, mold loft, etc. (Specifications 8861); also for one-story turret shop, 112 x 300 ft., with crane runways inside and outside of building, exterior crane runway to be about 100 ft. wide and 270 ft. long (Specifications 8862), and for foundations for one-story pipe works and copper shop (Specifications 9005).

Commanding Officer, Ordnance Department, Frankford Arsenal, Philadelphia, asks bids until Nov. 14 for one primer inserting machine, one bullet assembly press, and six horizontal toggle and crank, case bumping presses (Circular 356), one or two cartridge-loading machines, straight line, caliber 0.30 (Circular 365); until Nov. 17 for 85,000 lin. ft. of brass (Circular 382).

Hubeny Brothers, Roselle, N. J., manufacturers of steel products, are erecting a two-story plant addition, containing about 17,000 sq. ft. of floor space. A. Hubeny is president.

BUFFALO DISTRICT

Hope's Windows, Inc., Jamestown, N. Y., manufacturer of metal window casements and allied products, has plans for one-story addition to plant at East Jamestown, 100 x 400 ft. Cost close to $100,000 with equipment. Contract for foundations has been let to Daniel Elander, Inc., 341 East Third Street.

Allied Aircraft Corp., Buffalo, care of Bernhard J. Huber, M. & T. Building, attorney and representative, recently organized with capital of $225,000, is selecting site for local plant for production of training planes and other aircraft, parts manufacture and assembling. Plane units will be designed to sell in low-priced field.

Board of Education, City Hall, Buffalo, plans manual training department in new three-story high school in East Side district, for which bids will be asked soon. Cost about $1,400,000. Architectural department of board, address noted, is in charge.

NEW ENGLAND

Simplex Wire & Cable Co., 79 Sidney Street, Cambridge, Mass., has let general contract to McCreery & Theriault, 303 Columbus Avenue, Boston, for one-story addition, 40 x 100 ft. Cost over $45,000 with equipment. Charles T. Main, Inc., 201 Devonshire Street, Boston, is engineer.

Department of Public Buildings, City Hall, Cambridge, Mass., John J. Terry, superintendent, has let general contract to Edmund J. Rappoli Co., Inc., 515 Massachusetts Avenue, for one-story municipal service, repair and garage building, 175 x 232 ft., with extension, 41 x 64 ft., for city-owned trucks and automobiles. Cost about $150,000 with equipment. Charles R. Greco, 11 Beacon Street, Boston, is architect.

Commanding Officer, Ordnance Department, Springfield Armory, Springfield, Mass., asks bids until Nov. 14 for equipment for use with automatic lathes (Circular 109); until Nov. 17 for 15 motor-driven high-speed profilers (Circular 123).

Bridgeport Brass Co., Bridgeport, Conn., has let general contract to Edward E. Bray Co., 462 River Street, for one-story addition to tube mill, 110 x 220 ft. Cost over $100,000 with equipment. Fletcher-Thompson, Inc., Fairfield, Conn., is architect and engineer. Company also will make further extensions in pipe and tube mill by utilizing part of space recently vacated by removal of rolling mill machinery to new building completed for that division, and will install additional equipment.

Crompton & Knowles Loom Works, Worcester, Mass., has started work on additions to cost $40,000 without equipment. E. Whitehead Inc., 62 School Street, Worcester, is general contractor.

WASHINGTON DIST.

Bureau of Yards and Docks, Navy Department, Washington, has asked bids (no closing date stated) for one-story addition to mechanical shop at Norfolk Navy Yard (Specifications 8817). Cost reported over $200,000 with equipment.

Board of Education, Richmond, Va., has asked bids on general contract for one-story vocational shop for Bainbridge Junior High School. Cost over $100,000 with equipment. J. Binford Walford, 103 East Cary Street, is architect.

Constructing Quartermaster, Munitions Building, Washington, asks bids until Nov. 16 for one electric-operated freight elevator of worm gear traction type for storage and crating warehouse at Fort Myer, Arlington County, Va. (Circular 6141-29).

Charlotte County School Board, Keysville, Va., plans manual training department in new one-story central high school at Charlotte Court House, Va., for which general contract has been let to Taylor Co., Farmville, Va. Cost about $225,000. Raymond V. Long, State Board of Education Building, Richmond, Va., is architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 8 for steel gate valves (Schedule 4671), bench type equipment for testing insulation (Schedule 4714), valves, fittings, gaskets, etc. (Schedule 4678), motor-driven 16-in. planer (Schedule 4685) for Eastern and Western yards; copper and brass tubing and tubes (Schedule 4751); until Nov. 15, 840 phosphor bronze blank shells (Schedule 4765); until Nov. 22, two motor-driven boring machines (Schedule 4649) for Newport, R. I., naval station.

SOUTH ATLANTIC

Port Committee, Pensacola, Fla., has arranged bond issue of $1,549,000 for expansion and improvements at municipal waterfront properties, including one-story warehouse and compress building, with elevating, conveying and other equipment; grain elevator; fruit terminal, cold storage and refrigerating building, with car-loading and mechanical-handling facilities; extensions in municipal dock and other work. Project has been approved by City Planning Board, M. A. Touart, secretary.

South Carolina Public Service Authority, Columbia, S. C., asks bids until Nov. 9 for hydraulic turbine units, governors and accessory equipment, with total capacity of 213,000 hp., for installation in Pinopolis hydroelectric generating station, Santee-Cooper project; also for water-wheel-driven electric generators and auxiliary equipment, total rating of 181,000 kva., for installation in same station. Harza Engineering Co., 27 Cumberland Street, Charleston, S. C., is consulting engineer.

SOUTH CENTRAL

Town Council, Rayne, La., asks bids until Nov. 8 for extensions and improvements in municipal electric power plant, including new engine unit with accessories and other equipment. L. J. Voorhies, City Hall, Baton Rouge, La., is consulting engineer.

Jellico-Gluegem Coal Co., Myrick, Ky., recently organized, plans installation of coal-mining plant at Brush Creek coal properties, near Myrick, including tipple, conveying, loading and other mechanical-handling equipment; steam power house also is planned. Cost close to $60,000. New company is headed by Harry B. Fowler, Oneida, Tenn., and W. M. Dishman, Barboursville, Ky.

Town Council, Kosciusko, Miss., plans extensions and improvements in municipal electric power and waterworks station, including additional equipment. A bond issue of $65,000 has been approved.

SOUTHWEST

Board of Education, Springfield, Mo., has asked bids on general contract for two-story industrial arts building, 70 x 140 ft., on high school grounds near Central Street. Cost about $110,000 with equipment. William B. Ittner, Inc., 911 Locust Street, St. Louis, is architect and engineer.

Swift & Co., Little Rock, Ark., meat packer, edible oils, etc., plans rebuilding part of local oil mill recently destroyed by fire. Loss about $50,000 with equipment.

City Council, Lamar, Mo., has plans for new municipal electric power plant, using diesel engine-generator units and auxiliary equipment; also for electrical distributing system. Cost about $200,000. Financing has been arranged through Federal aid. E. T. Archer &

IDEAS THAT Clicked

HOW CAN WE HELP USERS SAVE ON HORSEPOWER AND STEP UP HEATING EFFICIENCY?
WIDE AREA BLADES! THAT'S THE ANSWER FOR EFFICIENCY
AND A STREAMLINED INLET TO SAVE HORSEPOWER
YOU'RE RIGHT. LOOK AT THE RESULT OF TESTS ON THESE 4 MAKES OF UNIT HEATERS!
IT'S A GREAT IDEA!

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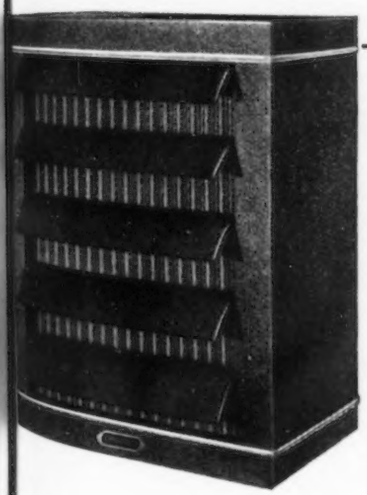

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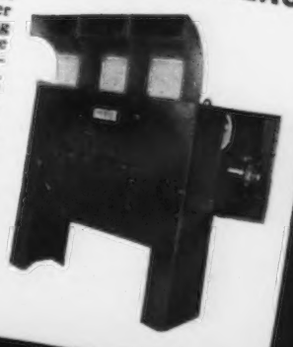

AMERICAN BLOWER

American Blower Corporation, 6000 Russell St., Detroit, Mich. • Division of the American Radiator and Standard Sanitary Corp. • Canadian Sirocco Co., Ltd., Windsor, Ontario

Co., New England Building, Kansas City, Mo., are consulting engineers.

Continental Supply Co., Continental Building, Dallas, Tex., oil well equipment and supplies, steel pipe, etc., has let general contract to George O'Rourke Construction Co., 2019 Jackson Street, Dallas, for one and two-story plant, 60 x 390 ft., with two one-story wing extensions, each 25 x 140 ft., at Navigation Boulevard and Industrial Way, Houston, Tex. Cost about $250,000 with equipment. Other units will be built later. Harry E. Weaver, Esperson Building, is architect and engineer.

Humble Oil & Refining Co., Houston, Tex., has approved plans for additions to main oil refinery at Baytown, Tex., comprising units adjoining present plant for a new phenol division. Cost close to $1,000,000 with equipment.

Board of Public Works, Houston, Tex., plans new one-story hangar, 110 x 160 ft., with shop and reconditioning facilities, at Howard Hughes municipal airport. Cost close to $80,000 with equipment. Fund of $250,000 has been arranged, partly through Federal aid, for this and other airport expansion.

Hussman-Ligonier Co., St. Louis, manufacturer of refrigerators, is erecting a one-story addition for a steel enameling plant, containing 16,100 sq. ft. of floor space. Cost $75,000.

Monsanto Chemical Co., Monsanto, Ill., is building a warehouse and phosphate plant for which there will be an expenditure of $100,000 for machinery.

Laclede Packing Co., St. Louis, is building a one-story addition containing 3825 sq. ft. of floor space. About $17,000 will be spent for machinery.

WESTERN PA. DIST.

Board of Public Education, Administration Building, Bellefield Avenue and Forbes Street, Pittsburgh, H. W. Cramblet, secretary, asks bids until Nov. 7 for steel lockers, copper pipe and other equipment.

North Pennsylvania Oil Co., Oil City, Pa., is arranging financing through sale of common stock to total about $325,000, part of proceeds to be used for expansion and improvements, including new buildings and equipment, drilling facilities, etc.

OHIO AND INDIANA

City Council, City Hall, Cincinnati, C. O. Sherrill, city manager, has asked bids on general contract for one-story municipal service, repair and garage building at Bates Avenue and Central Parkway, including equipment shops and other facilities for public works department motor trucks and cars. Cost about $510,000 with equipment. Financing has been arranged through Federal aid. Tietig & Lee, 34 West Sixth Street, are architects; Fosdick & Hilmer, Union Trust Building, are consulting engineers.

Isaly Dairy Co., Youngstown, Ohio, has approved plans for new one-story milk products plant in South side district and will begin superstructure this month. Cost about $400,000 with conveying, loading and other mechanical-handling equipment.

City Commission, Middletown, Ohio, has authorized vote on bond issue of $1,400,000 at November general election, for new municipal electric light and power plant and distributing system. Generating station with boiler units and accessories, steam turbo-generators and auxiliary equipment are estimated to cost $1,710,000, and total project $2,169,725, remainder of fund to be secured through Federal grant of $769,725, recently approved. Froehlich & Emery Engineering Co., Second National Bank Building, Toledo, is consulting engineer.

Mansfield City School District, Mansfield, Ohio, has asked bids on general contract for one-story vocational shop unit at senior high school. Cost over $60,000. Charles W. Conklin, Farmers' Bank Building, is architect.

Board of Public Works, City Hall, Indianapolis, Louis Brandt, president, has let general contract to Service Construction Co., Castle Hall Building, for one and two-story steel hangar, with repair and maintenance shop. 112 x 121 ft., at municipal airport. Cost about $100,000 exclusive of equipment. Philip Weisenberg, Architects' and Builders' Building, is architect.

Board of Public Works, Jasper, Ind., will take bids soon for extensions and improvements in municipal electric power plant, including new boiler unit and other equipment. Cost about $71,000. J. M. Rotz Engineering Co., Merchants' Bank Building, Indianapolis, is consulting engineer.

MICHIGAN DISTRICT

Buick Motor Division, General Motors Corp., Flint, Mich., has let general contract to Jerome A. Utley, 6031 Mansur Street, Detroit, for two-story addition, 310 x 750 ft., totaling about 225,000 sq. ft. of floor space, for parts and service divisions, with storage and distributing departments. It will replace present factories Nos. 18 and 34. Cost over $500,000 with equipment. Albert Kahn, Inc., New Center Building, Detroit, is architect and engineer.

Certain-Teed Products Corp., Military Road, Buffalo, Gypsum Division, plans modernization and improvements in branch mill at Grand Rapids, Mich., idle for several years, used for production of lath, wallboard and kindred products. New machinery will be installed, with facilities for employment of more than 75 men.

Village Council, Clinton, Mich., plans extensions and improvements in municipal electric power plant, including new equipment. Cost about $80,000. Financing has been arranged.

Yellow Truck & Coach Mfg. Co., Pontiac, Mich., is utilizing buildings on South Saginaw Street, formerly occupied by Wilson Foundry & Machine Co., for new machine shop in conjunction with gasoline engine-manufacturing division, recently established, and will have unit ready for service soon. All gasoline motors for trucks and coaches, heretofore secured from outside sources, will be produced at plant, including parts production and assembling.

MIDDLE WEST

Kerber Packing Co., 56 South Grove Street, Elgin, Ill., food products, has plans for two-story addition, 40 x 80 ft., to packing plant. Cost about $45,000 with equipment. Company plans other extensions soon.

State Department of Finance, Division of Purchases, State Capitol, Springfield, Ill., Maxwell S. Bibo, purchasing agent, is asking bids on different dates from Nov. 8 to 30, inclusive, for industrial and workshop equipment and materials for different institutions, road-building machinery and other mechanical equipment.

Fairfield School District, Fairfield, Iowa, J. W. Lindauer, secretary, plans manual training department in new two-story and basement high school, for which general construction contract will soon be awarded. Cost close to $495,000. Keffer & Jones, Masonic Temple, Des Moines, Iowa, are architects. Financing has been arranged through Federal aid.

State Board of Control, State Office Building, St. Paul, Minn., Downer Mullen, secretary, plans extensions and improvements in power house at State institution, Fergus Falls, Minn., including new boiler units, electric generator and auxiliary equipment. Cost about $300,000. Financing is being arranged through Federal aid. Larson & McLaren, Foshay Tower Building, Minneapolis, are architects. J. A. Fitzsimmons is engineer for board.

Signal Corps Procurement District, 1819 West Pershing Road, Chicago, asks bids until Nov. 8 for cable terminals (Circular 38).

Independent School District No. 2, McLeod County, Hutchinson, Minn., E. W. Enevoldson, clerk, asks bids until Nov. 8 for shop equipment for school; also for scientific equipment and appliances for laboratories.

Rath Packing Co., Waterloo, Iowa, meat packer, has let general contract to Jens Olesen & Sons Co., 1760 Sycamore Street, for two-story and basement addition. Cost close to $50,000 with equipment. John Bartley is company architect.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 8 for one 16-in. motor-driven tool room lathe (Schedule 4727) for Minneapolis, Minn.

Trane Co., La Crosse, Wis., manufacturer of heating and plumbing systems, space heaters, and similar products, has plans by Parkinson & Dockendorff, architects, Linker Building, for factory addition, 80 x 260 ft., principally one-story. Equipment will include overhead carrier system.

Board of Vocational Education, La Crosse, Wis., has low bid of $258,700 on general contract for additions and alterations to vocational school, 141 x 200 ft., two and three stories, to be built as PWA project at total cost of about $400,000. John B. Coleman is director of school.

PACIFIC COAST

Goleta Lemon Association, Goleta, Cal., has let general contract to Stanley H. Shave Construction Co., 1031 South Fairfax Avenue, Los Angeles, for one-story addition to fruit-packing plant, 120 x 155 ft., for storage and distribution. Cost over $65,000 with equipment. W. W. Ache, 301 North Citrus Avenue, Los Angeles, is architect.

Bureau of Yards and Docks, Navy Department, Washington, has let contract to Moore Dry Dock Co., Oakland, Cal., for structural steel for one-story foundry at Mare Island Navy Yard, Cal., at $229,675. Cost over $400,000 with equipment. Award also has been made to Charles L. Hoskins, Kettner Building, San Diego, Cal., for new fleet instruction school building at naval operating base, San Diego, at $168,700, exclusive of equipment (Specifications 8900).

Richmond Union High School District, Richmond, Cal., has asked bids on general contract for one-story vocational shop at El Cerrito high school. Cost about $150,000 with equipment. Dragon & Schmidts, 2068 Allston Street, Oakland, Cal., are architects.

Bureau of Supplies and Accounts, Navy Department, Washington, asks bids until Nov. 15 for one motor-driven milling machine (Schedule 4726) for naval station, San Pedro, Los Angeles.

Board of King County Supervisors, Seattle, has asked bids on general contract for one-story machine shop, with storage and distributing section, 62 x 183 ft., at Boeing airfield, with two-story adjoining unit for office service. Cost about $45,000, exclusive of equipment. Harry Sisler is county engineer.

J. D. Ross, administrator, Bonneville Project, 1300 N.E. Union Avenue, Portland, asks bids until Nov. 8 for line equipment, including conductor suspension clamps, conductor yokes, ground wire cable suspension clamps, clevises, ground wire cable anchor clevises, etc. (Circular 70).

City Council, Burbank, Cal., has approved plans for one-story building for equipment shop and warehouse for street department, totaling about 10,000 sq. ft. of floor space. Cost close to $40,000 with equipment.

FOREIGN

Australian Cellulose, Paper & Board Mfg. Co., Ltd., Adelaide, South Australia, recently organized with capital of $5,000,000, plans new mill near local plant of Imperial Chemical Industries, Ltd., from which certain materials for production will be secured. Plant will comprise one and multi-story units, with power house, machine shop and other mechanical departments, and will specialize in production of paper board stocks, wrapping papers and cellulose products, using straw as raw material. Cost over $1,000,000 with machinery. New company is headed by Sidney Powell, Adelaide, a member of State bank board; E. W. Holden and L. J. Hartnett, chairman of board and managing director respectively of General Motors Holdens, Ltd., Melbourne, Victoria; and T. R. Morris, Melbourne, managing director, Morris & Walker, Pty., Ltd., same city.